

NASA Contractor Report 3647

Program Listing for the REEDM (Rocket Exhaust Effluent Diffusion Model) Computer Program

**J. R. Bjorklund, R. K. Dumbauld,
C. S. Cheney, and H. V. Geary**

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Computer Program
Effluent Diffusion Model
KEMDM (Rocket Exhaust
Program Listing for the

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PERFORMED FOR

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Effluent Diffusion Model)
Computer Program**

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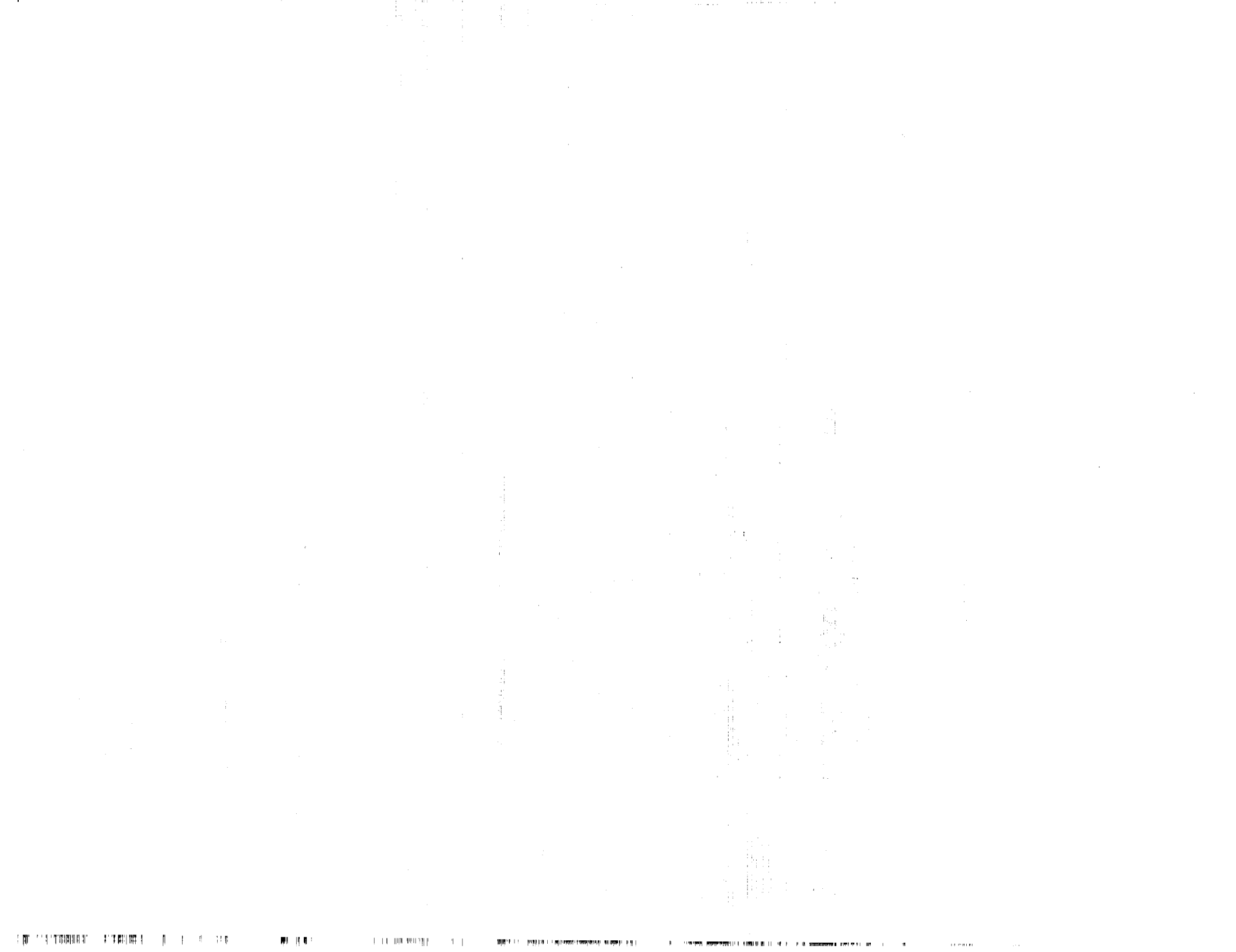
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National Aeronautics
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FOREWORD

This final report is submitted to the Atmospheric Sciences Division, Space Science Laboratory, Marshall Space Flight Center, in partial fulfillment of the requirements of Contract No. NAS8-34132.

This report contains a listing of the REEDM computer program. The program was designed for and is operational on Hewlett Packard HP1000 Multiprogramming Systems at the Atmospheric Sciences Division, Space Science Laboratory, NASA/Marshall Space Flight Center; at NASA/Kennedy Space Center; and at H. E. Cramer Company, Inc.

A description of the models, model input parameters, user's instructions for the program, and worked example problems are contained in NASA CR-3646.

The H. E. Cramer Company, Inc. is indebted to Mr. Joseph C. Sloan and Dr. Briscoe Stephens of the Atmospheric Sciences Division at MSFC for technical guidance and helpful suggestions in the development of the REEDM program and in the design of output formats. Mr. Norman Reavis, Atmospheric Sciences Division, MSFC, and Mr. Joseph Parker, KSC, assisted in the implementation of the programs at MSFC and KSC.

REEDM SOURCE MODULE &REEDM

```

FTN4
PROGRAM REEDM(3,200)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C*****
C
C      MAIN MODULE OF ROCKET EXHAUST EFFLUENT DIFFUSION ANALYSIS
C      (MULTI-LAYER) PROGRAM
C
C*****
C
C      TO REPORT PROGRAM ERRORS - CALL JAY R. BJORKLUND (801) 581-0220
C      H.E. CRAMER CO. INC., SALT LAKE CITY, UTAH.
C
C*****
C
C      THIS PROGRAM REQUIRES THE PROGRAM SEGMENTS READM, REDAM, RDATE,
C      RCLDM, RDHMM, RCONM, RCNOM, RPDPM, RGDPM, RGPDM, RCIMM ALONG
C      WITH THE MAIN REEDM PROGRAM FOR EXECUTION.
C
C      THE REEDM SOURCE PROGRAMS ARE - &REEDM, &READM, &REDAM, &RDATE,
C      &RDATN, &RCLDM, &RCLDN, &RMMRM, &RMMRN, &RDHMM, &RCONM, &RCNOM,
C      &RCONN, &RPDPM, &RPDPN, &RGDPM, &RGDPN, &RSUBM, &RCIMM,
C      AND &RCIMN.
C*****
C
C*****      PREPARING PROGRAM FOR EXECUTION      *****
C
C      :TR,/RMAS,1G,2G,3G,4G
C
C      The above command compiles the source code of REEDM where "1G"
C      through "4G" respectively correspond to the FORTRAN compiler
C      (FTN4 or FTN4X) options two through five.
C
C
C      :TR,/RMLD,1G
C
C      The above command loads the REEDM program for execution. Option
C      "1G" is a logical unit number to which the load map listing is
C      sent.
C
C
C      :TR,/RMRP,SP,2G,3G
C
C      Optionally, the above command may be used to save the REEDM
C      program as a type 6 file on disc. The desired disc cartridge
C      number is specified on option "2G". Transfer file 1/4RMRP has
C      other options which are described in the transfer file comments.

```

C		S0100500
C		S0100510
C	*****	*****S0100520
C	PROGRAM EXECUTION	S0100530
C		S0100540
C	:RU,REEDM,1G,2G,3G,4G,5G	S0100550
C		S0100560
C	The above command schedules REEDM where the user may pass upto	S0100570
C	five logical unit numbers having the following definitions:	S0100580
C		S0100590
C	1G - Input data logical unit number. This number is usually	S0100600
C	(as is the default) the terminal from which the user	S0100610
C	has scheduled the program. The user may enter a non-	S0100620
C	terminal number for "1G". In this case the program	S0100630
C	assumes a batch mode-type run which is discussed below.	S0100640
C	Moreover, if "1G" is set to 98 or 99, plot forms are	S0100650
C	generated. Refer to a section below for a discussion	S0100660
C	of this option.	S0100670
C	2G - Print output logical unit number. This number is	S0100680
C	usually the printer (logical unit 6).	S0100690
C	3G - Meteorological profile plot logical unit number. This	S0100700
C	number defaults to 12.	S0100710
C	4G - Maximum centerline profile plot logical unit number.	S0100720
C	5G - Isopleth plot logical unit number.	S0100730
C		S0100740
C	*****	*****S0100750
C	BATCH MODE PROGRAM EXECUTION	S0100760
C		S0100770
C	:RU,REEDM,1G,2G,3G,4G,5G	S0100780
C		S0100790
C	As mentioned above if the first logical unit number passed in	S0100800
C	the program execution command ("1G") is not a terminal unit then	S0100810
C	the program executes in a batch mode. All input data required	S0100820
C	to execute the program are read from the entered logical unit	S0100830
C	number.	S0100840
C	In this mode, preparation of an input data file is necessary	S0100850
C	before scheduling the program. For example, if the input data	S0100860
C	file exists on magnetic tape that has been positioned to the	S0100870
C	correct file and is on tape drive unit 8 then "1G" may be set	S0100880
C	to 8 in the program execution command. Or if, for example,	S0100890
C	the input data exists on a disc file, the disc file must first	S0100900
C	be associated with a valid logical unit number by using the	S0100910
C	File Manager "SL" command (:SL,50,"file name"). Then set "1G"	S0100920
C	to the associated logical unit number (50) in the program	S0100930
C	execution command.	S0100940
C	The batch mode has no user interaction except in special cases.	S0100950
C	As noted in the discussion of input data records 18 through 22	S0100960
C	described in the next section, the user may indicate in the	S0100970
C	input data file that user interaction is desired. In these	S0100980
C	special cases the program prompts the user for input in the same	S0100990
C	manner as the interactive mode. When the program or user is	S0101000
C	done with that portion of input, the program returns to the	S0101010
C	input data file for input and resumes the batch mode.	

C	The following section is a description of the content, format	S0101020
C	and order of data expected in the input data file for batch mode	S0101030
C	execution.	S0101040
C		S0101050
C		S0101060
C*****	PLOT FORM GENERATOR PROGRAM EXECUTION	*****S0101070
C		S0101080
C	:RU,REEDM,98or99,,3G,4G	S0101090
C		S0101100
C	When 98 or 99 is passed in the first parameter ("1G") of the	S0101110
C	program execution command, REEDM enters a plot form generator	S0101120
C	mode. No model calculations or other processing is performed	S0101130
C	in this mode. Upon exit of this mode the program terminates.	S0101140
C	If the user enters 98 for "1G", the program will plot the	S0101150
C	meteorological profile form on the plot unit specified in	S0101160
C	parameter "3G" (default is 12). The program prompts the user	S0101170
C	to ready the plot device before plotting. Upon completion of	S0101180
C	plotting a form, the program again prompts the user to plot	S0101190
C	another form or stop.	S0101200
C	If the user enters 99 for "1G", the program will plot the	S0101210
C	maximum centerline form on the plot unit specified in parameter	S0101220
C	"4G". Again, the program prompts the user to ready the plot	S0101230
C	device, re-plot the form or stop.	S0101240
C		S0101250
C		S0101260
C*****	BATCH MODE INPUT PARAMETERS	*****S0101270
C		S0101280
C		S0101290
C*RECORD 01 (A2)		S0101300
C		S0101310
C	RUN TYPE - Enter "O" for operational and "P" for production run	S0101320
C	types. A blank record defaults to operational.	S0101330
C	Note that the batch mode does not allow a research	S0101340
C	run type.	S0101350
C		S0101360
C*RECORD 02 (3A2)		S0101370
C		S0101380
C	FILE NAME - Enter the meteorological data sounding file name.	S0101390
C	A blank record defaults to file name "RRSOND".	S0101400
C	If TAPE## is entered, the program assumes it is	S0101410
C	to read the sounding data from magnetic tape unit	S0101420
C	lu 8 in the KSC65 format starting at the sounding	S0101430
C	number given by ##.	S0101440
C		S0101450
C*RECORD 03 (*)	This record is entered only for production ("P") runs.	S0101460
C		S0101470
C	NUMBER OF RUNS - Enter a value for the number of data cases to	S0101480
C	be processed under the production run type.	S0101490
C	Default is 1. The program assumes you have	S0101500
C	stacked this number of sounding data sets on	S0101510
C	file or magnetic tape and produces calculations	S0101520
C	for the specified number of data sets.	S0101530

C		S0101540
C		S0101550
C	C*RECORD 04 (A2)	S0101560
C		S0101570
C	MODEL - Enter "C" for the concentration/dosage, "W" for the	S0101580
C	washout deposition and "G" for the gravitational	S0101590
C	deposition models. A blank record defaults to the	S0101600
C	concentration/dosage model.	S0101610
C		S0101620
C	C*RECORD 05 (I4,1X,R1,A2,1X,I2,1X,A2,A1,1X,I4)	S0101630
C		S0101640
C	LAUNCH DATE - Enter the launch time and date. A blank record	S0101650
C	defaults to the date given on record 5 of data	S0101660
C	file ?LTIME. If data file ?LTIME does not exist,	S0101670
C	the default is the current time and date. Enter	S0101680
C	a four-digit hour, three-character time zone,	S0101690
C	two-digit day of the month, three-character month	S0101700
C	and four-digit year, where each item is separated	S0101710
C	by one blank space.	S0101720
C		S0101730
C	C*RECORD 06 (A2)	S0101740
C		S0101750
C	LAUNCH VEHICLE - Enter "S" for Space Shuttle, "T" for Titan,	S0101760
C	"D2" for Delta 2914, and "D3" for Delta 3914	S0101770
C	vehicles. A blank record defaults to the	S0101780
C	Space Shuttle vehicle.	S0101790
C		S0101800
C	C*RECORD 07 (A2)	S0101810
C		S0101820
C	LAUNCH TYPE - Enter "N" for normal, "S" for single engine,	S0101830
C	and "C" for conflagration launch types. A	S0101840
C	blank record defaults to a normal launch type.	S0101850
C		S0101860
C	C*RECORD 08 (*)	S0101870
C		S0101880
C	PROPELLANT TEMP. - Enter the vehicle propellant temperature in	S0101890
C	degrees Celsius. A zero value or blank	S0101900
C	record defaults to the average monthly	S0101910
C	temperature determined by the month entered	S0101920
C	for the launch time in Record 5.	S0101930
C		S0101940
C	C*RECORD 09 (12A2) This record is entered only for the concentration/	S0101950
C	dosage ("C") or washout deposition ("W") models.	S0101960
C		S0101970
C	SPECIES - Enter "H" for HCl, "A" for Al2O3, "C2" for CO2, and	S0101980
C	"C" for CO species. Note that the CO2 and CO species	S0101990
C	applicable only to the concentration/dosage model.	S0102000
C	A blank record defaults to the HCl species.	S0102010
C		S0102020
C	C*RECORD 10 (A2)	S0102030
C		S0102040
C	COMPLEX NUMBER - Enter the launch complex number. A blank record	S0102050
C	defaults to a number depending on the launch	

C	vehicle specified in record 6.	S0102060
C		S0102070
C*RECORD 11	(A2) OR (*) This record is entered only for the	S0102080
C	concentration/dosage model.	S0102090
C		S0102100
C	CALCULATION HEIGHT - Enter "S" for surface and "ST" for cloud	S0102110
C	stabilization calculation heights.	S0102120
C	Additionally, the user may enter a value	S0102130
C	for the calculation height in meters.	S0102140
C	A zero value or blank record defaults to	S0102150
C	a surface calculation height.	S0102160
C		S0102170
C*RECORD 12	(A2)	S0102180
C		S0102190
C	CLOUD SHAPE - Enter "E" for elliptical and "S" for spherical	S0102200
C	cloud shapes. A blank record defaults to an	S0102210
C	elliptical cloud shape.	S0102220
C		S0102230
C**	Note: Records 13 through 16 are entered only when the washout	S0102240
C**	deposition ("W") model is selected in record 4.	S0102250
C		S0102260
C*RECORD 13	(A2)	S0102270
C		S0102280
C	MAXIMUM OR TIME-DEPENDENT - Enter "M" for maximum possible and	S0102290
C	"T" for time dependent washout	S0102300
C	deposition calculations. A blank	S0102310
C	record defaults to the maximum	S0102320
C	possible washout deposition.	S0102330
C		S0102340
C*RECORD 14	(A2) OR (*)	S0102350
C		S0102360
C	RAINFALL RATE - Enter "H" for heavy (0.3), "M" for moderate (0.2)	S0102370
C	and "L" for light (0.1) rainfall rates in inches	S0102380
C	per hour. Additionally, the user may enter a	S0102390
C	value for the desired rainfall rate. A zero	S0102400
C	value or blank record defaults to a heavy	S0102410
C	rainfall rate.	S0102420
C		S0102430
C*RECORD 15	(*) This record is entered only for time-dependent	S0102440
C	washout deposition.	S0102450
C		S0102460
C	TIME - Enter the time in seconds the rain starts after the	S0102470
C	launch. A blank record defaults to zero seconds.	S0102480
C		S0102490
C*RECORD 16	(*)	S0102500
C		S0102510
C	RAIN DURATION - Enter the duration of the rain in hours after	S0102520
C	the launch. A blank record defaults to one	S0102530
C	hour.	S0102540
C		S0102550
C**	Note: For a production run type, specified in record 1, sets of	S0102560
C**	records 17 through 20 must be entered. The number of sets	S0102570

C**	equals the number of runs specified in record 3.	S0102580
C		S0102590
C*RECORD 17	(A2)	S0102600
C		S0102610
C	PLOT MET. PROFILE - Enter "Y" or "YE" for yes and "N" or "NO"	S0102620
C	for no regarding whether or not the meteor-	S0102630
C	ological profile is to be plotted.	S0102640
C	Enter "F" to indicate yes and to plot the	S0102650
C	profile form. This is the portion of the	S0102660
C	plot that is independent of the sounding	S0102670
C	data. A blank record defaults to yes with	S0102680
C	no form plotted.	S0102690
C		S0102700
C*RECORD 18	(A2)	S0102710
C		S0102720
C	BOUNDARY LAYERING - Because the default boundary layers values	S0102730
C	are not known apriori, enter "Y" or "YE" to	S0102740
C	display the default boundary layers values	S0102750
C	and interactively modify the values. Any	S0102760
C	other entry for this record causes the	S0102770
C	program to use the default boundary layers	S0102780
C	values.	S0102790
C		S0102800
C*RECORD 19	(A2)	S0102810
C		S0102820
C	SIGMA(A) - Because the default SIGMA(A) value is not known	S0102830
C	apriori, enter "A" to display the default SIGMA(A)	S0102840
C	value and interactively modify the value. Any	S0102850
C	other entry for this record causes the program to	S0102860
C	use the default SIGMA(A) value.	S0102870
C		S0102880
C*RECORD 20	(A2)	S0102890
C		S0102900
C	SIGMA(E) - Because the default SIGMA(E) value is not known	S0102910
C	apriori, enter "A" to display the default SIGMA(E)	S0102920
C	value and interactively modify the value. Any	S0102930
C	other entry for this record causes the program to	S0102940
C	use the current value of SIGMA(A) for SIGMA(E).	S0102950
C		S0102960
C**	Note: For a production run type, specified in record 1,	S0102970
C**	records 21, 22, 25 and 26 are not entered.	S0102980
C		S0102990
C*RECORD 21	(A2)	S0103000
C		S0103010
C	PLOT MAX. CENTERLINE - Enter "Y" or "YE" for yes and "N" or "NO"	S0103020
C	for no regarding whether or not the	S0103030
C	maximum centerline result values are to	S0103040
C	be plotted. Enter "F" to indicate yes	S0103050
C	and to plot the maximum centerline form.	S0103060
C	This is the portion of the plot that is	S0103070
C	independent of the calculated results.	S0103080
C	A blank record defaults to yes with no	S0103090

C	form plotted.	S0103100
C	Note: All plot options are interactive	S0103110
C	with the user.	S0103120
C		S0103130
C	C*RECORD 22 (A2)	S0103140
C		S0103150
C	PLOT ISOPLETHS - Enter "Y" or "YE" for yes and "N" or "NO" for	S0103160
C	no regarding whether or not the isopleths of	S0103170
C	the results are to be plotted. A blank record	S0103180
C	defaults to yes.	S0103190
C	Note: All plot options are interactive with	S0103200
C	the user.	S0103210
C		S0103220
C	C*RECORD 23 (A2)	S0103230
C		S0103240
C	DISCRETE RECEPTORS - Enter "Y" or "YE" or a logical unit number	S0103250
C	for yes and "N" or "NO" for no regarding	S0103260
C	regarding whether or not to make calcula-	S0103270
C	tions at user-entered discrete receptor	S0103280
C	locations. If a logical unit number is	S0103290
C	entered, the discrete receptor locations	S0103300
C	are read from that number. A blank record	S0103310
C	defaults to yes.	S0103320
C		S0103330
C	C*RECORD 24 (*) This record is entered only if a yes response is	S0103340
C	given in record 23.	S0103350
C	Note: This record is repeated until a negative	S0103360
C	value is entered for the first parameter (RANGE)	S0103370
C	or upto a maximum of 60 times, whichever occurs	S0103380
C	first.	S0103390
C		S0103400
C	RANGE - Enter the distance from the launch pad to the discrete	S0103410
C	receptor location in meters.	S0103420
C	BEARING - Enter the bearing in degrees the discrete receptor	S0103430
C	is located with respect to North.	S0103440
C	HEIGHT - Enter the height of the discrete receptor in meters	S0103450
C	(calculation height). Note: This parameter is entered	S0103460
C	only for the concentration/dosage model.	S0103470
C	COMMENTS - Enter any comment information desired in input columns	S0103480
C	31 through 50. This information is printed on the	S0103490
C	output listing. Default is all blank.	S0103500
C		S0103510
C	C*RECORD 25 (A2) This record is entered only for the concentration/	S0103520
C	dosage model.	S0103530
C		S0103540
C	CALCULATION HEIGHT - Enter "Y" or "YE" for yes and "N" or "NO"	S0103550
C	for no regarding whether or not to change	S0103560
C	the calculation height. For a yes response	S0103570
C	follow this record with a calculation	S0103580
C	height value and re-enter records 17	S0103590
C	through 24. A blank record defaults to yes.	S0103600
C		S0103610

C*RECORD 26 (A2)	This record is entered only for the washout	S0103620
C	depositon model.	S0103630
C		S0103640
C	WASHOUT DEP. CALCULATION - Enter "Y" or "YE" for yes and "N" or	S0103650
C	"NO" for no regarding whether or not	S0103660
C	to change the washout deposition	S0103670
C	calculations to maximum possible or	S0103680
C	time-dependent. For a yes response	S0103690
C	re-enter records 13, 15 (if	S0103700
C	applicable) and 17 through 24	S0103710
C	following this record. A blank	S0103720
C	record defaults to yes.	S0103730
C		S0103740
C*RECORD 27 (A2)		S0103750
C		S0103760
C	ANOTHER CASE - Enter "Y" or "YE" for yes and "N" or "NO" for no	S0103770
C	regarding whether or not to process another	S0103780
C	meteorological data case. For a yes response	S0103790
C	follow this record with another set of data	S0103800
C	input parameters beginning at record 1.	S0103810
C	Otherwise, the REEDM program terminates.	S0103820
C	A blank record defaults to yes.	S0103830
C		S0103840
C		S0103850
C*****	UPDATE 8213 INFORMATION	*****S0103860
C		S0103870
C		S0103880
C	This update replaces all previous updates of the REEDM programs	S0103890
C	and is not compatible with any previous updates. The following	S0103900
C	is a summary of the program changes from the previous update 8150.	S0103910
C		S0103920
C	The program now exists as a segmented program - one main program	S0103930
C	with twelve segments. The previous versions consisted of	S0103940
C	several independent programs. This change eliminates the need	S0103950
C	for a disc file containing the common information being passed	S0103960
C	among the programs.	S0103970
C		S0103980
C	Gravitational deposition results are calculated in particles per	S0103990
C	square meter in addition to the milligrams per square meter units.	S0104000
C	Moreover, for research type runs the particles calculated are	S0104010
C	printed for each settling category.	S0104020
C		S0104030
C	The default launch time and date are now on record 1 of file	S0104040
C	?LTIME rather than record 5 of ?R50CR or ?R50TY. Files ?R50CR	S0104050
C	and ?R50TY are not longer used (see record 05 above).	S0104060
C		S0104070
C	The maximum number of discrete receptors is 60 instead of 20.	S0104080
C		S0104090
C	The discrete receptor locations may be read by the program from	S0104100
C	a logical unit number specified by the user. In addition to	S0104110
C	entering "yes" or "no" in reponse to the calculation of discrete	S0104120
C	receptors prompt, the user may also enter a logical unit number.	S0104130

C	In this case the program will read all discrete receptor loca-	S0104140
C	tions from the logical unit number entered. The program will	S0104150
.	TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S0104480
.	FS(20),MDLNAM(12),DBAR(20)	S0104490
C-----	COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S0104500
	LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S0104510
.	MODEL4,MODEL5,MODEL6	S0104520
	INTEGER RUNNUM,RT,CL,CS	S0104530
	COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,OC,QT,HEAT,ZM,H,	S0104540
.	DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S0104550
.	SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S0104560
.	,MIXING,MAXDEP,LAYBOT(3)	S0104570
.	,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S0104580
.	ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S0104590
.	MINUS1,MINUS9,MINUS1,MINUS9,	S0104600
.	MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S0104610
.	RT(24),TPROPC,IDXRT	S0104620
C-----	TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S0104630
	INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S0104640
.	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S0104650
.	CLRLNE,INSLNE,DELNE	S0104660
	COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S0104670
.	INVNDR(2),ULINE(2),	S0104680
.	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S0104690
.	CLRLNE,INSLNE,DELNE,	S0104700
.	IESCAJ(3),NULL,IBLNK,	S0104710
.	IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S0104720
C-----	VEHICLE PARAMETERS	S0104730
	COMMON /VCLPR/ VPAR(17)	S0104740
C-----	TIME PARAMETERS	S0104750
	COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	S0104760
.	LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	S0104770
C-----	SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)	S0104780
	COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),	S0104790
.	RH(30),PTEMP(30),SIGEP(30),SIGAP(30)	S0104800
C-----	LAYER PARAMETERS	S0104810
	COMMON /LAYER/ DX,DY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),	S0104820
.	SIGYO(29)	S0104830
C-----	CALCULATED BOUNDARY DATA (FOR NEW LAYERS)	S0104840
	COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)	S0104850
C-----	CALCULATED NEW LAYER PARAMETERS	S0104860
	COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),	S0104870
.	SPEEDN(32)	S0104880
C-----	CONVERSION FACTORS	S0104890
	COMMON /CNVRT/ QCONV(4),QPDEPH	S0104900
C		S0104910
C*****	COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****	S0104920
	COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)	S0104930
C-----	READ/WRITE BUFFER	S0104940
C-----	A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879	S0104950
C*****		S0104960

C		S0104970
C-----	EQUIVALENCE STATEMENTS	S0104980
	EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))	S0104990
	, (IPU2,IPAR(4)),(IPU3,IPAR(5))	S0105000
	EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)	S0105010
C		S0105020
C****	END OF COMMON AREA	****S0105030
Cc		S0105040
C		S0105050
	INTEGER DFLUS(5),CRTARA(10)	S0105060
C		S0105070
C		S0105080
C	THE FOLLOWING DATA STATEMENTS ARE SITE-SPECIFIC.	S0105090
C		S0105100
C****	KSC ENHANCED DISPLAY CRT LUS.	S0105110
	DATA CRTARA /7,16,8*0/	S0105120
C****	MSFC ENHANCED DISPLAY CRT LUS.	S0105130
C++++	DATA CRTARA /4,5,7,7*0/	S0105140
C****	H.E. CRAMER CO. ENHANCED DISPLAY CRT LUS.	S0105150
C++++	DATA CRTARA /10,11,8*0/	S0105160
C		S0105170
C	DEFAULT LOGICAL UNIT NUMBERS. DFLUS(1) THROUGH DFLUS(5)	S0105180
C	RESPECTIVELY CORRESPOND TO THE FIVE NUMBERS PASSED IN	S0105190
C	THE RUN STATEMENT (RU,REEDM,IP1,IP2,IP3,IP4,IP5). THE	S0105200
C	PURPOSE OF EACH LOGICAL UNIT NUMBER IS DISCUSSED ABOVE.	S0105210
C****	KSC DEFAULT LUS.	S0105220
	DATA DFLUS /7,6,12,20,21/	S0105230
C****	MSFC DEFAULT LUS.	S0105240
C++++	DATA DFLUS /1,6,12,12,12/	S0105250
C****	H.E. CRAMER CO. DEFAULT LUS.	S0105260
C++++	DATA DFLUS /10,6,12,12,12/	S0105270
C		S0105280
C		S0105290
	DATA IFJ/IHF/	S0105300
C		S0105310
C		S0105320
C****	FIRST EXECUTABLE STATEMENT.	S0105330
C		S0105340
	CALL RMPAR(IFRMT)	S0105350
	IF(NNNEST) 10,110,100	S0105360
10	CONTINUE	S0105370
	NNNEST = 1	S0105380
C		S0105390
C****	DETERMINE EXECUTION NAME GIVEN TO REEDM	S0105400
C		S0105410
	CALL PNAME(NAMEP)	S0105420
C		S0105430
C****	INITIALIZE LOGICAL UNITS.	S0105440
C		S0105450
	DO 20 I = 1,5	S0105460
	IPAR(I) = DFLUS(I)	S0105470
	IF(IFRMT(I) .GT. 0) IPAR(I) = IFRMT(I)	S0105480

20	CONTINUE	S0105490
	IF (IFRMT(2) .LT. 0) IPAR(2) = IABS(IFRMT(2))	S0105500
C		S0105510
	ICU = 0	S0105520
	NCU = LOGLU(ICU)	S0105530
	CRT = .FALSE.	S0105540
	DO 30 I = 1,10	S0105550
30	IF(ICU .EQ. CRTARA(I)) CRT = .TRUE.	S0105560
	IF (IFRMT(2) .LT. 0) CRT = .FALSE.	S0105570
	IF (ICU .LT. 0.OR.ICU .GT. 15) ICU = NCU	S0105580
	IF(CRT) GOTO 50	S0105590
	DO 40 I = 1,28	S0105600
40	ALTSET(I) = NULL	S0105610
	TAB = 40B	S0105620
	TAB2 = NULL	S0105630
C*	CHECK FOR PLOT FORM GENERATION.	S0105640
50	IF(IIU .NE. 98) GOTO 60	S0105650
	I1 = IPU1	S0105660
	I2 = 4	S0105670
	GOTO 70	S0105680
60	IF(IIU .NE. 99) GOTO 80	S0105690
	I1 = IPU2	S0105700
	I2 = 10	S0105710
70	NNNEST = 5	S0105720
	CALL LOADS(I2,0,0,I1,0,BATCH)	S0105730
80	CONTINUE	S0105740
C*	CHECK FOR BATCH MODE DATA INPUT.	S0105750
	BATCH = IFTTY(IIU) .EQ. 0	S0105760
C		S0105770
C		S0105780
90	NNNTRY = 1	S0105790
	IERROR(1) = 0	S0105800
	GOTO 130	S0105810
C		S0105820
C****	CHECK FOR UNRECOVERABLE ERROR (NEGATIVE),	S0105830
C****	NORMAL RETURN (ZERO) OR	S0105840
C****	RESTART CONDITION (POSITIVE).	S0105850
C		S0105860
100	CONTINUE	S0105870
	IF(IERROR(1)) 110,120,90	S0105880
110	NNNTRY = 7	S0105890
	GOTO 140	S0105900
C		S0105910
C****	DETERMINE PROGRAM CALL LEVEL DEPTH (NNNEST).	S0105920
C		S0105930
120	CONTINUE	S0105940
	GOTO (130,150,220,280,330,140), NNNEST	S0105950
C		S0105960
C***	LOAD SEGMENT READM (NNNEST = 1).	S0105970
C		S0105980
130	CALL LOADS(1,0,0,0,0,BATCH)	S0105990
140	CALL LOADS(13,0,0,0,0,BATCH)	S0106000

C		S0106010
C***	LOAD ONE OF THE SEGMENTS SCHEDULED BY READM (NNNEST = 2).	S0106020
C		S0106030
150	CONTINUE	S0106040
	IF(NNNTRY .LT. 5) GOTO 210	S0106050
	IF(NNNTRY .NE. 5) GOTO 170	S0106060
C*	DETERMINE IF EXHAUST CLOUD CAN BE PLOTTED.	S0106070
	IF(GOOD .NE. 1) GOTO 160	S0106080
	NNNEST = 2	S0106090
	LLNTRY = 6	S0106100
	GOTO 210	S0106110
160	NNNTRY = 6	S0106120
170	IF(NNNTRY .NE. 6) GOTO 200	S0106130
	IF(BATCH) GOTO 190	S0106140
C*	CONTINUE WITH MODEL CALCULATIONS?	S0106150
	WRITE(ICU,9004) INVNDR,INV,OFF,ULINE,OFF	S0106160
	INPT1 = IBLNK	S0106170
	READ(IIU,9001) INPT1	S0106180
	WRITE(ICU,9002) IESCAJ	S0106190
	IF (INPT1 .EQ. INJ.OR.INPT1 .EQ. INOJ) GO TO 90	S0106200
	IF (INPT1.EQ.MINUS1 .OR. INPT1.EQ.MINUS9) GOTO 90	S0106210
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 180	S0106220
	WRITE (ICU,9003) INV,OFF,20,4	S0106230
	GO TO 170	S0106240
180	WRITE(ICU,9008) INV,OFF	S0106250
C*	GOTO MODEL SEGMENT.	S0106260
190	NNNTRY = MODEL + 2	S0106270
	LLNTRY = 0	S0106280
	GOTO 210	S0106290
C*	RETURN TO MODEL SEGMENT AFTER PLOTTING.	S0106300
200	NNNTRY = MODEL + 5	S0106310
	LLNTRY = 0	S0106320
210	CALL LOADS(NNNTRY,LLNTRY,1,0,0,BATCH)	S0106330
C		S0106340
C***	LOAD A SEGMENT SCHEDULED BY A SEGMENT IN LEVEL 2 (NNNEST = 3).	S0106350
C		S0106360
220	CONTINUE	S0106370
	IF(NNNTRY .LT. 4) GOTO 270	S0106380
	IF (IRUN .EQ. 1) GO TO 200	S0106390
	I2 = IFJ	S0106400
C*	PLOT MAXIMUM CENTERLINE?	S0106410
	IF(NNNTRY .NE. 4) GOTO 250	S0106420
230	IF(.NOT.BATCH)WRITE(ICU,9005) CURSUP,DELIN,INVNDR,INV,OFF,ULINE,	S0106430
	*OFF	S0106440
	INPT1 = IBLNK	S0106450
	READ(IIU,9001) INPT1	S0106460
	IF(INPT1 .EQ. MINUS9 .OR. INPT1 .EQ. MINUS1) GOTO 90	S0106470
	WRITE(ICU,9002) IESCAJ	S0106480
	IF(INPT1 .EQ. INJ .OR. INPT1 .EQ. INOJ) GOTO 250	S0106490
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 240	S0106500
	WRITE (ICU,9003) INV,OFF,21,0	S0106510
	GO TO 230	S0106520

240	NNNTRY = 4	S0106530
	LLNTRY = 7	S0106540
	GOTO 270	S0106550
C*	PLOT ISOPLETHS?	S0106560
250	IF(.NOT.BATCH) WRITE(ICU,9006) INVNDR,INV,OFF,ULINE,OFF	S0106570
	INPT1 = IBLNK	S0106580
	READ(IIU,9001) INPT1	S0106590
	IF(.NOT.BATCH) WRITE(ICU,9002) IESCAJ	S0106600
	IF(INPT1 .EQ. INJ .OR. INPT1 .EQ. INOJ) GOTO 200	S0106610
	IF(BATCH) GOTO 260	S0106620
	IF(INPT1 .EQ. MINUS1) GOTO 230	S0106630
	IF(INPT1 .EQ. MINUS9) GOTO 90	S0106640
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 260	S0106650
	WRITE (ICU,9003) INV,OFF,22,0	S0106660
	GO TO 250	S0106670
260	LLNTRY = MODEL + 5	S0106680
	NNNEST = 2	S0106690
	NNNTRY = 6	S0106700
270	CONTINUE	S0106710
	CALL LOADS(NNNTRY,LLNTRY,2,IPU2,I2,BATCH)	S0106720
C		S0106730
C***	LAST LEVEL (NNNEST = 4). CALL MET. PROFILE PLOT FORM	S0106740
C***	GENERATOR OR PLOT SOUNDING DATA.	S0106750
C		S0106760
280	CONTINUE	S0106770
	NNNEST = LLNEST	S0106780
	I2 = IFJ	S0106790
	IF(NNNTRY .NE. 1) GOTO 320	S0106800
	IF(BATCH) GOTO 310	S0106810
	WRITE(ICU,9007) CLRDSP,IPAR(3),INV,OFF,ULINE,OFF	S0106820
290	INPT1 = IBLNK	S0106830
	READ(IIU,9001) INPT1	S0106840
	WRITE(ICU,9002) IESCAJ,IESCAJ	S0106850
	IF(INPT1 .EQ. MINUS1 .OR. INPT1 .EQ. MINUS9) GOTO 90	S0106860
	WRITE(ICU,9002) IESCAJ	S0106870
	NNNTRY = 2	S0106880
	IF (INPT1 .EQ. IBLNK) GO TO 320	S0106890
	IF (INPT1 .EQ. IFJ) GO TO 300	S0106900
	WRITE (ICU,9003) INV,OFF,17,1	S0106910
	WRITE (ICU,9007) IBLNK,IPAR(3),INV,OFF,ULINE,OFF	S0106920
	GO TO 290	S0106930
300	CONTINUE	S0106940
	NNNTRY = 1	S0106950
310	NNNEST = 4	S0106960
320	CONTINUE	S0106970
	LLNTRY = 2	S0106980
	NNNTRY = NNNTRY + 3	S0106990
	CALL LOADS(NNNTRY,LLNTRY,0,IPU1,I2,BATCH)	S0107000
C		S0107010
C***	PROGRAM TERMINATION FROM PLOT FORM GENERATION.	S0107020
C		S0107030
330	CONTINUE	S0107040

STOP	S0107050
C	S0107060
C	S0107070
CF*** FORMAT STATEMENTS.	S0107080
CF	S0107090
9001 FORMAT(40A2)	S0107100
9002 FORMAT (2A2,A1)	S0107110
9003 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S0107120
*,I2,1H.,I1/)	S0107130
9004 FORMAT(55H DO YOU WISH TO CONTINUE WITH THE MODEL CALCULATIONS? (,	S0107140
1 2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_)	S0107150
9005 FORMAT(2A2,43H DO YOU WISH TO PLOT MAXIMUM CENTERLINES? (,2A2,	S0107160
1 1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_)	S0107170
9006 FORMAT(33H DO YOU WISH TO PLOT ISOPLETHS? (,2A2,1HY,2A2,2HES,	S0107180
1 2A2,1H,,2A2,1HN,2A2,4HO):_)	S0107190
9007 FORMAT(A2,51H MOUNT A METEOROLOGICAL PROFILE FORM ON PLOTTER LU ,	S0107200
1I2/32X,2A2,14HSPACE - RETURN,2A2,11H WHEN READY/	S0107210
2 32X,6HENTER ,2A2,1HF,2A2,19H TO PLOT THE FORM:_)	S0107220
9008 FORMAT(1X,2A2,11HPLEASE WAIT,2A2/)	S0107230
END	S0107240

	SUBROUTINE LOADS(NTRY,LTRY,INDEX,IPRAM1,IPRAM2,BATCH)	S0200000
	. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S0200010
C		S0200020
C	THIS ROUTINE SCHEDULES THE SEGMENT INDICATED BY THE FORMAL	S0200030
C	ARGUMENT NTRY. NTRY AND INDEX ARE USED TO ACCESS THE ARRAY	S0200040
C	NAMER WHICH CONTAINS THE SEGMENT NAMES.	S0200050
C	IF A SEGMENT WAS NOT SUCCESSFULLY LOADED (IERR = 5), A "WAIT	S0200060
C	UNTIL LOADED LOOP" IS PERFORMED.	S0200070
C	ONCE THE SEGMENT NAME HAS BEEN DETERMINED, THE OLD ENTRY	S0200080
C	POINT IS REPLACED BY THE NEW ONE.	S0200090
C		S0200100
C		S0200110
C		S0200120
C	-----INPUT OPTIONS	S0200130
	REAL LAMBDA	S0200140
	INTEGER FILE,GOOD,TITLE	S0200150
	COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S0200160
	ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S0200170
	XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S0200180
	IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S0200190
	ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S0200200
	,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S0200210
	,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S0200220
	TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S0200230
	FS(20),MDLNAM(12),DBAR(20)	S0200240
C	-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S0200250
	INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S0200260
	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S0200270
	CLRLNE,INSLNE,DELIN	S0200280
	COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S0200290
	INVNDR(2),ULINE(2),	S0200300
	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S0200310
	CLRLNE,INSLNE,DELIN,	S0200320
	IESCAJ(3),NULL,IBLNK,	S0200330
	IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S0200340
C		S0200350
	LOGICAL BATCH	S0200360
	DIMENSION NAMER(3,13),NENTRY(11,2),IMESS(6)	S0200370
C		S0200380
C		S0200390
	EQUIVALENCE (IIU,IPAR(1)),(IOU,IPAR(2))	S0200400
	DATA NAMER /2HRE,2HAD,1HM,2HRD,2HAT,1HM,2HRC,2HLD,1HM,	S0200410
1	2HRM,2HMR,1HM,2HRM,2HMR,1HM,2HRC,2HON,1HM,	S0200420
2	2HRP,2HDP,1HM,2HRG,2HDP,1HM,2HRD,2HHM,1HM,	S0200430
3	2HRC,2HIM,1HM,2HRC,2HNO,1HM,2HRG,2HPD,1HM,	S0200440
4	2HRE,2HDA,1HM/	S0200450
	DATA NENTRY /2,3,3,4,5,6,7,8,6,7,8,	S0200460
1	9,9,9,10,10,10,10,4*0/	S0200470
	DATA IMESS/2HOF,2H , ,3*2H ,2H,8/	S0200480
C		S0200490
C		S0200500

IF (NTRY .LT. 0) GO TO 80	S0200510
I = 0	S0200520
J = 0	S0200530
IPRAM3 = 1	S0200540
NSEG = NTRY	S0200550
IF (INDEX .GT. 0) NSEG = NENTRY(NTRY, INDEX)	S0200560
IF (LTRY .EQ. 0) GOTO 10	S0200570
IF (NSEG .EQ. 10 .AND. NTRY .EQ. 6 .AND. INDEX .EQ. 2) IPRAM3 = 2	S0200580
NTRY = LTRY	S0200590
LTRY = 0	S0200600
10 IF (NTRY .EQ. 9 .AND. NSEG .EQ. 6) NSEG = 11	S0200610
IF (NTRY .EQ. 11 .AND. NSEG .EQ. 8) NSEG = 12	S0200620
IF (NSEG .EQ. 5) IPRAM3 = 2	S0200630
LSTSEG = NSEG	S0200640
LPRAM1 = IPRAM1	S0200650
LPRAM2 = IPRAM2	S0200660
LPRAM3 = IPRAM3	S0200670
20 CONTINUE	S0200680
CALL SEGLD(NAMER(1, NSEG), IERR, IPRAM1, IPRAM2, IPRAM3)	S0200690
I = I+1	S0200700
IF (I .GT. 2) GO TO 30	S0200710
IF (IERR .NE. 5) GO TO 30	S0200720
IF (NTRY .LT. 0) GO TO 20	S0200730
GO TO 10	S0200740
30 IF (BATCH) GO TO 50	S0200750
J = J+1	S0200760
IF (J .GT. 3) GO TO 50	S0200770
WRITE (ICU, 9001) INV, (NAMER(L, NSEG), L=1, 3), OFF	S0200780
40 WRITE (ICU, 9002) INV, (NAMER(L, NSEG), L=1, 3), OFF, INV, NAMEP, OFF, INV,	S0200790
*NAMEP, OFF	S0200800
PAUSE	S0200810
IF (NTRY .LT. 0) GO TO 20	S0200820
GO TO 10	S0200830
50 WRITE (IOU, 9003) (NAMER(I, NSEG), I=1, 3)	S0200840
60 CONTINUE	S0200850
STOP	S0200860
70 RETURN	S0200870
80 NSEG = LSTSEG	S0200880
IPRAM1 = LPRAM1	S0200890
IPRAM2 = LPRAM2	S0200900
IPRAM3 = LPRAM3	S0200910
WRITE (IOU, 9004) INV, (NAMER(I, NSEG), I=1, 3), OFF, INV, IVERS, OFF	S0200920
IF (BATCH) GO TO 60	S0200930
WRITE (ICU, 9004) INV, (NAMER(I, NSEG), I=1, 3), OFF, INV, IVERS, OFF	S0200940
DO 90 I=1, 3	S0200950
90 IMESS(I+2) = NAMER(I, NSEG)	S0200960
I = MESSS(IMESS, 12)	S0200970
GO TO 40	S0200980
9001 FORMAT (2A2, 41H*** REEDM ERROR 002, CANNOT LOAD SEGMENT , 5A2/)	S0200990
9002 FORMAT (13HEITHER TYPE ', 2A2, 3HRP, , 5A2, 22H' UNDER FMGR OR TYPE ',	S0201000
*2A2, 3HOF, , 3A2, 2H, 1, 2A2, 21H' UNDER RTE TO ABORT. /6H TYPE ', 2A2,	S0201010
*3HGO, , 5A2, 13H' TO CONTINUE)	S0201020

9003 FORMAT (////42H *** REEDM ERROR 002, CANNOT LOAD SEGMENT ,3A2) S0201030
9004 FORMAT (2A2,30H *** REEDM ERROR 003, SEGMENT ,3A2,25H HAS WRONG UPS0201040
*DATE NUMBER,,2A2/2A2,23H MUST BE UPDATE NUMBER ,I4,2A2/) S0201050
END S0201060

BLOCK DATA	S0300000
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S0300010
Cc	S0300020
C**** BEGIN COMMON AREA	****S0300030
C 04/02/82	S0300040
C-----MATH PARAMETERS AND CONSTANTS	S0300050
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S0300060
C-----INPUT OPTIONS	S0300070
REAL LAMBDA	S0300080
INTEGER FILE,GOOD,TITLE	S0300090
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S0300100
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S0300110
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S0300120
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S0300130
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S0300140
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S0300150
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S0300160
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S0300170
. FS(20),MDLNAM(12),DBAR(20)	S0300180
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S0300190
LOGICAL ISNDF0,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S0300200
. MODEL4,MODEL5,MODEL6	S0300210
INTEGER RUNNUM,RT,CL,CS	S0300220
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S0300230
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S0300240
. SIGZ,ISNDF0,CRT,LAYTOP(3),ITDU,KEEP	S0300250
. ,MIXING,MAXDEP,LAYBOT(3)	S0300260
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S0300270
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S0300280
. MINUS1,MINUS9,MINS1,MINS9,	S0300290
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S0300300
. RT(24),TPROPC,IDXRT	S0300310
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S0300320
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S0300330
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S0300340
. CLRLNE,INSLNE,DELIN	S0300350
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S0300360
. INVNDR(2),ULINE(2),	S0300370
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S0300380
. CLRLNE,INSLNE,DELIN,	S0300390
. IESCAJ(3),NULL,IBLNK,	S0300400
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S0300410
C-----VEHICLE PARAMETERS	S0300420
COMMON /VCLPR/ VPAR(17)	S0300430
C-----TIME PARAMETERS	S0300440
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	S0300450
. LDAY,IYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	S0300460
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)	S0300470
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),	S0300480
. RH(30),PTEMP(30),SIGEP(30),SIGAP(30)	S0300490
C-----LAYER PARAMETERS	S0300500
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),	S0300510

.	SIGYO(29)	S0300520
C-----	CALCULATED BOUNDARY DATA (FOR NEW LAYERS)	S0300530
	COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)	S0300540
C-----	CALCULATED NEW LAYER PARAMETERS	S0300550
	COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),	S0300560
.	SPEEDN(32)	S0300570
C-----	CONVERSION FACTORS	S0300580
	COMMON /CNVRT/ QCONV(4),QPDEPH	S0300590
C		S0300600
C*****	COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****	S0300610
	COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)	S0300620
C-----	READ/WRITE BUFFER	S0300630
C-----	A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879	S0300640
C*****		S0300650
C		S0300660
C-----	EQUIVALENCE STATEMENTS	S0300670
	EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))	S0300680
.	,(IPU2,IPAR(4)),(IPU3,IPAR(5))	S0300690
	EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)	S0300700
C		S0300710
C****	E N D O F C O M M O N A R E A	****S0300720
Cc		S0300730
C		S0300740
C		S0300750
C	SITE-SPECIFIC DATA STATEMENT.	S0300760
	DATA LOCATN /2HKS,2HC /	S0300770
	DATA RUNNUM /1/	S0300780
C		S0300790
C		S0300800
C	REVISION NUMBER DATA STATEMENT.	S0300810
	DATA IVERSN /8213/	S0300820
C		S0300830
C		S0300840
C		S0300850
	DATA MINUS1,MINUS9,MINS1,MINS9 /2H-1,2H-9,-1,-9/	S0300860
	DATA IYSJ/1HY/,IYESJ/2HYE/,INJ/1HN/,INOJ/2HNO/,NAMEP/3*1H /	S0300870
	DATA NNNEST /-1/	S0300880
	DATA IERROR /5*0/	S0300890
	DATA NCOM(1),NTOTAL(1) /2077,3569/	S0300900
	DATA NULL/0/	S0300910
	DATA PLUS(745)/-9925.0/	S0300920
C		S0300930
	DATA PI,G,CP,MAXLEV,GAMMAI,GAMMAC /3.141593,9.8,0.24,30,0.64,0.50/	S0300940
C		S0300950
	DATA ALTSET,OFF,BLNKNG,INV,INVHF,ULINE,INVNDR	S0300960
	1 /15451B,40400B,15446B,62100B,15446B,62101B,	S0300970
	2 15446B,62102B,15446B,62112B,15446B,62104B,15446B,62106B/	S0300980
	DATA TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,CLRLNE,	S0300990
	1 INSLNE,DELINE /11B,4411B,15461B,15462B,15501B,15502B,15504B,	S0301000
	2 15512B,15513B,15514B,15515B/	S0301010
	DATA IESCAJ /015501B,015512B,1H_/, IBLNK /2H /	S0301020
C		S0301030

DATA RT/2H O,2HPE,2HRA,2HTI,2HON,2HAL,	S0301040
. 2H ,2H ,2HRE,2HSE,2HAR,2HCH,	S0301050
. 2H ,2HPR,2HOD,2HUC,2HTI,2HON,	S0301060
. 2H ,2HDI,2HAG,2HNO,2HST,2HIC/	S0301070
DATA CL/2H ,2H ,2H ,2H S,2HUR,2HFA,2HCE,	S0301080
. 2H S,2HTA,2HBI,2HLI,2HZA,2HTI,2HON/	S0301090
DATA CS/2HEL,2HLI,2HPT,2HIC,2HAL,	S0301100
. 2H S,2HPP,2HER,2HIC,2HAL/	S0301110
END	S0301120

SUBROUTINE IFNBR(IBUF,NCHAR,IER,LU)	S0400000
DIMENSION IBUF(40),JBUF(80),JCHAR(11)	S0400010
DATA JCHAR/1H ,1H.,1H.,,1H-,1H+,1HE,1H/,1H0,1H9,1HA,1HZ/	S0400020
IF (NCHAR .EQ. -1) GO TO 20	S0400030
IF (NCHAR .LT. 0) GO TO 30	S0400040
DO 10 I=1,40	S0400050
10 IBUF(I) = JCHAR(I)	S0400060
20 READ (LU,9001) IBUF	S0400070
30 CALL CODE(80)	S0400080
READ (IBUF,9002) JBUF	S0400090
IER = 1	S0400100
N = IABS(NCHAR)	S0400110
I = ITLOG(L)	S0400120
IF (I .LT. N) N = I	S0400130
IF (NCHAR .EQ. -1) N = 4	S0400140
DO 50 L=1,N	S0400150
DO 40 I=1,7	S0400160
C CHECK FOR SPECIAL CHARACTER, PART OF NUMERIC DATA	S0400170
IF (JBUF(L) .EQ. JCHAR(I)) GO TO 50	S0400180
40 CONTINUE	S0400190
C CHECK FOR NUMERIC VALUE	S0400200
IF (JBUF(L) .GE. JCHAR(8).AND.JBUF(L) .LE. JCHAR(9)) GO TO 50	S0400210
GO TO 80	S0400220
50 CONTINUE	S0400230
IER = 0	S0400240
IF (NCHAR .NE. -1) GO TO 80	S0400250
IER = 1	S0400260
DO 70 I=6,20	S0400270
IF (I.EQ.9.OR.I.EQ.12.OR.I.EQ.16) GO TO 70	S0400280
IF (JBUF(I) .EQ. JCHAR(1)) GO TO 70	S0400290
IF (I.GE.6.AND.I.LE.8) GO TO 60	S0400300
IF (I.GE.13.AND.I.LE.15) GO TO 60	S0400310
C CHECK FOR NUMERIC VALUE	S0400320
IF (JBUF(I) .GE. JCHAR(8).AND.JBUF(I) .LE. JCHAR(9)) GO TO 70	S0400330
GO TO 80	S0400340
C CHECK FOR ALPHABETIC VALUE	S0400350
60 IF (JBUF(I) .GE. JCHAR(10).AND.JBUF(I) .LE. JCHAR(11)) GO TO 70	S0400360
GO TO 80	S0400370
70 CONTINUE	S0400380
IER = 0	S0400390
80 RETURN	S0400400
9001 FORMAT (40A2)	S0400410
9002 FORMAT (80A1)	S0400420
END	S0400430

REEDM SOURCE MODULE &READM

FTN4	S0500000
PROGRAM READM(5)	S0500010
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S0500020
C::	S0500030
C::	S0500040
C:::	S0500050
C:::	S0500060
C::: ORGANIZATION: H. E. CRAMER CO., INC.	S0500070
C:::	S0500080
C::: WORK FOR: DR. J. B. STEPHENS (ES84)	S0500090
C:::	S0500100
C::: PROGRAM CODE: REEDM	S0500110
C:::	S0500120
C::: PROGRAM DESCRIPTION: INPUT USER DATA FOR ROCKET EXHAUST	S0500130
C::: EFFLUENT DIFFUSION ANALYSIS	S0500140
C::: (MULTI-LAYER)	S0500150
C:::	S0500160
C::: INPUT: USER SPECIFIED OPTIONS	S0500170
C:::	S0500180
C::: OUTPUT: PRINTED AND DISPLAYED LISTING OF USER INPUT VALUES	S0500190
C:::	S0500200
C::	S0500210
C::	S0500220
C	S0500230
Cc	S0500240
C**** BEGIN COMMON AREA ****	S0500250
C 04/02/82	S0500260
C-----MATH PARAMETERS AND CONSTANTS	S0500270
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S0500280
C-----INPUT OPTIONS	S0500290
REAL LAMBDA	S0500300
INTEGER FILE,GOOD,TITLE	S0500310
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S0500320
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S0500330
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S0500340
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S0500350
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S0500360
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S0500370
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S0500380
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S0500390
. FS(20),MDLNAM(12),DBAR(20)	S0500400
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S0500410
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S0500420
. MODEL4,MODEL5,MODEL6	S0500430
INTEGER RUNNUM,RT,CL,CS	S0500440
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H.	S0500450
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S0500460
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S0500470
. ,MIXING,MAXDEP,LAYBOT(3)	S0500480
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S0500490

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.          ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),      S0500500
.          MINUS1,MINUS9,MIN51,MIN59,                      S0500510
.          MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S0500520
.          RT(24),TPROPC,IDXRT                              S0500530
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S0500540
      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,          S0500550
.          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S0500560
.          CLRLNE,INSLNE,DELNE                             S0500570
      COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKG(2),INV(2),INVHF(2), S0500580
.          INVNDR(2),ULINE(2),                             S0500590
.          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S0500600
.          CLRLNE,INSLNE,DELNE,                             S0500610
.          IESCAJ(3),NULL,IBLNK,                             S0500620
.          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)        S0500630
C-----VEHICLE PARAMETERS                                  S0500640
      COMMON /VCLPR/ VPAR(17)                              S0500650
C-----TIME PARAMETERS                                    S0500660
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S0500670
.          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)      S0500680
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S0500690
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S0500700
.          RH(30),PTEMP(30),SIGEP(30),SIGAP(30)             S0500710
C-----LAYER PARAMETERS                                   S0500720
      COMMON /LAYER/ DX,DY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S0500730
.          SIGYO(29)                                         S0500740
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)         S0500750
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)            S0500760
C-----CALCULATED NEW LAYER PARAMETERS                    S0500770
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S0500780
.          SPEEDN(32)                                       S0500790
C-----CONVERSION FACTORS                                 S0500800
      COMMON /CNVRT/ QCONV(4),QPDEPH                       S0500810
C                                                         S0500820
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION***** S0500830
      COMMON /EXTRA/      NCOM(1),      NTOTAL(1),      PLUS(900) S0500840
C-----READ/WRITE BUFFER                                  S0500850
C-----A R R A Y   = 2077 + 1 + 1 + 2 * 900 = 3879 S0500860
C*****S0500870
C                                                         S0500880
C-----EQUIVALENCE STATEMENTS                             S0500890
      EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S0500900
.          ,(IPU2,IPAR(4)),(IPU3,IPAR(5))                  S0500910
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)       S0500920
      EQUIVALENCE (IDCB(1),PLUS(1)),(INPT(1),PLUS(73))     S0500930
C                                                         S0500940
C****          E N D   O F   C O M M O N   A R E A          ****S0500950
Cc                                                         S0500960
CF-----INPUT FORMAT STATEMENTS                           S0500970
      9001 FORMAT (40A2)                                     S0500980
      9002 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC. S0500990
.          *,I2,IH.,I2/)                                     S0501000
      9003 FORMAT (2A2,A1)                                  S0501010

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9004 FORMAT (I4,2A2,1X12,1XA2,A1,1X14) S0501020
9005 FORMAT (39H *** REEDM ERROR 004, CANNOT FIND FILE ,7A2) S0501030
9006 FORMAT(20A1) S0501040
9007 FORMAT (41H *** REEDM WARNING 005, CANNOT FIND FILE ,7A2,20H FOR LS0501050
  *AUNCH TIME AND/34H DATE, USING CURRENT TIME AND DATE/) S0501060
9008 FORMAT (44H *** REEDM WARNING 006, UNABLE TO OPEN FILE ,7A2,20H FOS0501070
  *R LAUNCH TIME AND/34H DATE, USING CURRENT TIME AND DATE/) S0501080
CF-----OUTPUT FORMAT STATEMENTS S0501090
9009 FORMAT(40H GRAVITATIONAL SETTLING CATEGORIES DATA) S0501100
9010 FORMAT((6X,9(F5.4,1H,),F5.4)) S0501110
9011 FORMAT (1X,32(2H**)/1X,3(2H**),5X,42HNASA/MSFC MULTIPLE LAYER TECS0501120
  1HNIQUE - REEDM,5X,3(2H**)/1X,3(2H**),12X,6HUPDATE,I5,14H LOCATIS0501130
  2ON ,2A2,12X,3(2H**)) S0501140
9012 FORMAT(1X,3(2H**),5X,42HEnter '-1' to change previous input value.S0501150
  1,5X,3(2H**)/1X,3(2H**),5X,44HEnter '-9' to start at beginning of pS0501160
  2rogram.,3X,3(2H**)/1X,3(2H**),5X,41HEnter '-9' at beginning to aboS0501170
  3rt program.,6X,3(2H**)) S0501180
9013 FORMAT(1X,3(2H**),15X,21HBATCH MODE DATA INPUT,16X,3(2H**)/ S0501190
  1 1X,32(2H**)/) S0501200
9014 FORMAT (1X,3(2H**),5X,43Hthe first input option shown is the defauS0501210
  1lt,4X,3(2H**)) S0501220
9015 FORMAT(48H AVERAGE PARTICLE SIZE DIAMETERS (MICROMETERS) =, S0501230
  1 12X,F5.2) S0501240
9016 FORMAT(6H ENTER,I3,47H AVERAGE PARTICLE SIZE DIAMETERS (MICROMETERS0501250
  1S):) S0501260
9017 FORMAT(6H ENTER,I3,45H REFLECTION COEFFICIENT (NO REF. = 0) VALUESS0501270
  1:) S0501280
9018 FORMAT(33H FREQUENCY OF OCCURRENCE VALUES =,27X,F5.4) S0501290
9019 FORMAT(6H ENTER,I3,53H FREQUENCY OF OCCURRENCE VALUES (SUM MUST TOS0501300
  1TAL 1.0):) S0501310
9020 FORMAT(73H *** REEDM WARNING 007, FREQUENCY OF OCCURRENCE VALUES DS0501320
  1O NOT SUM TO 1.0,/35H TYPE "N" - RETURN TO NORMALIZE BY ,F8.5, S0501330
  232H OR SPACE - RETURN TO CONTINUE:_) S0501340
9021 FORMAT (1X,32(2H**)/) S0501350
9022 FORMAT (I2,1X,I2,11X,I2,2X,A2,A1,3X,I4) S0501360
9023 FORMAT (78H *** REEDM WARNING 008, A CALCULATION HEIGHT ¶ 5 METERSSS0501370
  * WILL PRODUCE ERRONEOUS/18H RESULTS FOR AL203//) S0501380
9024 FORMAT (55H DO YOU WISH TO ENTER A DIFFERENT CALCULATION HEIGHT? (S0501390
  *,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S0501400
9025 FORMAT (//////////5A2) S0501410
9026 FORMAT(17H ENTER RUN TYPE (,2A2,1HO,2A2,10HPERATIONAL,2A2,1H,,2A2,S0501420
  *1HR,2A2,8HESEARCH,,2A2,1HP,2A2,12HRODUCTION):_) S0501430
9027 FORMAT(2A2,10H RUN TYPE:,43X,6A2) S0501440
9028 FORMAT(38H ENTER METEOROLOGICAL DATA FILE NAME (,7A2,3H):_) S0501450
9029 FORMAT(2A2,31H METEOROLOGICAL DATA FILE NAME:,28X,3A2) S0501460
9030 FORMAT(34H ENTER NUMBER OF RUNS TO BE MADE (,2A2,12,2A2,3H):_) S0501470
9031 FORMAT(2A2,27H NUMBER OF RUNS TO BE MADE:,34X,I4) S0501480
9032 FORMAT(19H ENTER MODEL TYPE (,2A2,1HC,2A2,17HONCENTRATION/DOS.,2A2S0501490
  *,1H,,2A2,1HW,2A2,12HASHOUT DEP.,2A2,1HG,2A2,20HRAVITATIONAL DEP.)S0501500
  *:_) S0501510
9033 FORMAT(2A2,12H MODEL TYPE:,29X,12A2) S0501520
9034 FORMAT(29H ENTER LAUNCH TIME AND DATE (,2A2,I4,2A2,1X,I2,1X,A2,A1,S0501530

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*1X,I4,2A2,2H):,23A2,1H)	S0501540
9035 FORMAT (23H *** REEDM WARNING 009,/ *40H INVALID MONTH ENTERED - PLEASE RE-ENTER,12A2,1H)	S0501550 S0501560
9036 FORMAT(3A2,22H LAUNCH TIME AND DATE:,23X,I4,2A2,1XI2,1XA2,A1,1XI4)	S0501570
9037 FORMAT(23H ENTER LAUNCH VEHICLE (,2A2,1HS,2A2,6HHUTTLE,2A2,1H,,2A2S0501580 *,1HT,2A2,5HITAN,,2A2,1HD,2A2,4HELTA,2A2,1H2,2A2,4H914,,2A2,1HD,2A2S0501590 *,4HELTA,2A2,1H3,2A2,6H914):_)	S0501600 S0501610
9038 FORMAT(2A2,16H LAUNCH VEHICLE:,35X,7A2)	S0501620
9039 FORMAT(20H ENTER LAUNCH TYPE (,2A2,1HN,2A2,5HORMAL,2A2,1H,,2A2,1HSS0501630 *,2A2,13HINGLE ENGINE,,2A2,1HC,2A2,15HONFLAGRATION):_)	S0501640
9040 FORMAT(2A2,13H LAUNCH TYPE:,38X,7A2)	S0501650
9041 FORMAT(45H ENTER PROPELLANT TEMPERATURE (30 DAY AVG.) (,2A2,F5.2, S0501660 *2A2,10H DEG. C):_)	S0501670
9042 FORMAT(2A2,33H PROPELLANT TEMPERATURE (DEG. C):,24X,F8.2)	S0501680
9043 FORMAT(28H ENTER ONE OR MORE SPECIES (,2A2,1HH,2A2,2HCL,2A2,1H,, S0501690 *2A2,1HA,2A2,5HL203,,2A2,1HC,2A2,1HO,2A2,1H2,2A2,1H,,2A2,1HC,2A2, S0501700 *4HO):_)	S0501710
9044 FORMAT(2A2,9H SPECIES:,32X,12A2)	S0501720
9045 FORMAT(31H ENTRAINMENT PARAMETERS GAMMAX=,F3.2,8H GAMMAY=,F3.2, S0501730 *8H GAMMAZ=,F3.2,9H CHANGE (,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2, S0501740 *5HES):_)	S0501750
9046 FORMAT(2A2,50H THE PRODUCT OF GAMMAX*GAMMAY*GAMMAZ SHOULD EQUAL , S0501760 *F3.2,6H CUBED)	S0501770
9047 FORMAT(2A2,15H ENTER GAMMAX (,2A2,F3.2,2A2,3H):_)	S0501780
9048 FORMAT(2A2,15H ENTER GAMMAY (,2A2,F3.2,2A2,3H):_)	S0501790
9049 FORMAT(2A2,15H ENTER GAMMAZ (,2A2,F3.2,2A2,3H):_)	S0501800
9050 FORMAT (75H *** REEDM WARNING 010, THE PRODUCT OF THE GAMMA'S IS IS0501810 *NCORRECT, CONTINUE? /2H (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2, S0501820 *4HO):_)	S0501830
9051 FORMAT(2A2,32H ENTRAINMENT PARAMETERS GAMMAX=,F4.2,8H GAMMAY=, S0501840 *F4.2,8H GAMMAZ=,F4.2)	S0501850
9052 FORMAT(30H ENTER LAUNCH COMPLEX NUMBER (,2A2,3H39A,2A2,1H,,2A2, S0501860 *3H39B,2A2,1H,,2A2,3H39C,2A2,1H,,2A2,2H40,2A2,1H,,2A2,2H41,2A2,1H,, S0501870 *2A2,2H17,2A2,3H):_)	S0501880
9053 FORMAT(2A2,43H PLEASE CONFIRM - IS LAUNCH COMPLEX NUMBER ,A2,A1, S0501890 *6H OK? (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_)	S0501900
9054 FORMAT(2A2,23H LAUNCH COMPLEX NUMBER:,39X,A2,A1)	S0501910
9055 FORMAT(30H CALCULATIONS TO BE DONE AT? (,2A2,1HS,2A2,6HURFACE,2A2, S0501920 *1H,,2A2,2HST,2A2,12HABILIZATION,,2A2,1HA,2A2,9HNOTHER):_)	S0501930
9056 FORMAT(2A2,28H CALCULATIONS TO BE DONE AT:,23X,7A2)	S0501940
9057 FORMAT(2A2,36H ENTER CALCULATION HEIGHT (METERS) (,2A2,F8.2,2A2, S0501950 *10H METERS):_)	S0501960
9058 FORMAT(2A2,37H CALCULATIONS TO BE DONE AT (METERS):,20X,F8.2)	S0501970
9059 FORMAT(19H ENTER CLOUD SHAPE(,2A2,1HE,2A2,9HLLIPTICAL,2A2,1H,,2A2, S0501980 *1HS,2A2,11HPHERICAL):_)	S0501990
9060 FORMAT(2A2,13H CLOUD SHAPE:,42X,5A2)	S0502000
9061 FORMAT(57H ENTER ABSORPTION COEFFICIENT FOR GASES ONLY (RNG:0 TO 1S0502010 *,,2A2,16HDEF. = NO ABS.=0,2A2,3H):_)	S0502020
9062 FORMAT(2A2,24H ABSORPTION COEFFICIENT:,37X,F4.2)	S0502030
9063 FORMAT(26H ENTER DECAY COEFFICIENT (,2A2,10HNO DECAY=0,2A2,3H):_)	S0502040
9064 FORMAT(2A2,19H DECAY COEFFICIENT:,42X,F4.2)	S0502050
9065 FORMAT(31H DIFFUSION COEFFICIENTS ALPHA=,F3.1,6H BETA=,F3.1,	

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      *9H CHANGE (,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0502060
9066 FORMAT(2A2,15H ENTER ALPHA:_) S0502070
9067 FORMAT(2A2,14H ENTER BETA:_) S0502080
9068 FORMAT(2A2,24H DIFFUSION COEFFICIENTS:,,28X,6HALPHA=,F4.2,6H BETA=, S0502090
      *F4.2) S0502100
9069 FORMAT(34H DOWNWIND EXPANSION DISTANCES XRY=,F5.1,5H XRZ=,F5.1, S0502110
      *9H CHANGE (,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0502120
9070 FORMAT(2A2,12H ENTER XRY:_) S0502130
9071 FORMAT(2A2,12H ENTER XRZ:_) S0502140
9072 FORMAT(2A2,30H DOWNWIND EXPANSION DISTANCES:,,20X,4HXRY=,F8.2, S0502150
      *5H XRZ=,F8.2) S0502160
9073 FORMAT(2A2,44H DISTANCE FROM PAD TO SIGXO MEASUREMENT PT.:,15X, S0502170
      *F8.2) S0502180
9074 FORMAT(38H CONCENTRATION AVERAGING TIME (TIMAV=,2A2,F5.1,2A2, S0502190
      *15H SEC.) CHANGE (,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0502200
9075 FORMAT(2A2,14H ENTER TIMAV:_) S0502210
9076 FORMAT(2A2,36H CONCENTRATION AVERAGING TIME (SEC):,21X,F8.2) S0502220
9077 FORMAT(32H NUMBER OF SETTLING CATEGORIES =,30X,I3/52H TERMINAL FALL S0502230
      *L VELOCITY VALUES (METERS PER SECOND) =,8X,F5.4) S0502240
9078 FORMAT(56H DO YOU WISH TO CHANGE THE GRAVITATIONAL SETTLING DATA (S0502250
      *,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0502260
9079 FORMAT(2A2,53H ENTER THE NUMBER OF SETTLING CATEGORIES (MAXIMUM ISS0502270
      *,I2,3H):_) S0502280
9080 FORMAT(2A2,6H ENTER,I3,52H TERMINAL FALL VELOCITY VALUES (METERS PS0502290
      *ER SECOND):_) S0502300
9081 FORMAT(32H REFLECTION COEFFICIENT VALUES =,28X,F5.4) S0502310
9082 FORMAT(28H ENTER ONE OR MORE SPECIES (,2A2,1HH,2A2,2HCL,2A2,1H,, S0502320
      *2A2,1HA,2A2,7HL2O3):_) S0502330
C-----TYPE AND DIMENSION STATEMENTS S0502340
      INTEGER MONTHS(24),LV(28),LT(21),SP(12),LC(12) S0502350
      DIMENSION VPARS(17,5),LMODEL(12,3),IDCB(144),NAMF(3) S0502360
      DIMENSION INPT(10),AVTMP(12) S0502370
      DIMENSION VSDEF(20),FSDEF(20),GAMDEF(20),DBRDEF(20) S0502380
      DIMENSION NDX(2) S0502390
C S0502400
      EQUIVALENCE (INPT(1),INPT1) S0502410
C-----DATA STATEMENTS S0502420
C-----VPARS( 1-17)=SHUTTLE (18-34)=TITAN (35-51)=DELTA 2914 S0502430
C (55-72)=DELTA 3914 (73-90)=MINUTEMAN S0502440
C ORDER OF DATA IS: QC1,QC2,QC3,QT1,QT2,QT3,A,B,C,HEATN,HEATM, S0502450
C HEATA,HCL%,CO2%,CO%,AL2O3% S0502460
      DATA VPARS/1.521923E7,3.84505682E6,9.887260711E5,1.251174E9, S0502470
      . 5.075475E8,1.015095E9,.6522129891,.4680846, S0502480
      . .375,1479.7,1062.35,1000.0,.1146,.25029,.00042,.18279, S0502490
      . .0002, S0502500
      . 5.437528E6,2.718764E6,1.359382E6,3.2625168E8, S0502510
      . 1.6312584E8,3.2625168E8,.429580469,.5184223, S0502520
      . 5.0,2021.1,1010.55,1000.0,.1932,.2665,.0222, S0502530
      . .2819,.0002, S0502540
      . 8.360685E5,9.09811E4,2.729434E5,2.887598E7, S0502550
      . 3.14229E6,1.885373E7,.922156,.432703,.54,1766.0, S0502560
      . 1000.0,690.0,.1218,.2055,.0156,.2214,.0002, S0502570

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.	1.057557E6,1.482923E5,3.70731E5,6.70269E7,	S0502580
.	9.398616E6,4.699308E7,1.245756,.4180947,	S0502590
.	0.0,1449.9,1000.0,411.18,.1589,.2783,.0331,.1936,	S0502600
.	.0002,	S0502610
.	4.684476E5,4.684476E5,1.171119E5,2.8106856E7,	S0502620
.	2.8106856E7,2.8106856E7,.469982,.463333,0.0,	S0502630
.	2055.9,2055.9,1000.0,.1866,.2055,.0156,.3391,	S0502640
.	.0002/	S0502650
.	DATA AVTMP/16.06,19.59,20.87,23.43,25.74,27.67,	S0502660
.	28.38,28.63,28.02,26.29,22.86,18.68/	S0502670
.	DATA MONTHS/2HJA,1HN,2HFE,1HB,2HMA,1HR,2HAP,1HR,2HMA,1HY,2HJU,1HN,	S0502680
.	2HJU,1HL,2HAU,1HG,2HSE,1HP,2HOC,1HT,2HNO,1HV,2HDE,1HC/	S0502690
.	DATA LV/2H S,2HPA,2HCE,2H S,2HHU,2HTT,2HLE,	S0502700
.	2H ,2H ,2H T,2HIT,2HAN,2H I,2HII,	S0502710
.	2H ,2H ,2HDE,2HLT,2HA ,2H29,2H14,	S0502720
.	2H ,2H ,2HDE,2HLT,2HA ,2H39,2H14/	S0502730
.	DATA LT/2H ,2H ,2H ,2H ,2HNO,2HRM,2HAL,	S0502740
.	2H S,2HIN,2HGL,2HE ,2HEN,2HGI,2HNE,	S0502750
.	2H C,2HON,2HFL,2HAG,2HRA,2HTI,2HON/	S0502760
.	DATA SP/2H ,2H H,2HCL,	S0502770
.	2H ,2H C,2HO2,	S0502780
.	2H ,2H ,2HCO,	S0502790
.	2H A,2HL2,2HO3/	S0502800
.	DATA LC/2H39,1HA,2H39,1HB,2H39,1HC,2H40,1H ,2H41,1H ,2H17,1H /	S0502810
.	DATA LMODEL/2H ,2H ,2HCO,2HNC,2HEN,2HTR,2HAT,2HIO,2HN/,	S0502820
1	2HDO,2HSA,2HGE,	S0502830
2	2H ,2H ,2H ,2HWA,2HSH,2HOU,2HT ,2HDE,2HPO,	S0502840
3	2HSI,2HTI,2HON,	S0502850
4	2HGR,2HAV,2HIT,2HAT,2HIO,2HNA,2HL ,2HDE,2HPO,	S0502860
5	2HSI,2HTI,2HON/	S0502870
.	DATA NVSDEF,VSDEF,GANDEF,FSDEF	S0502880
1	/10,10*.1078,10*0.0,20*0.0,.0002,.0151,.1182,.1175,.1724,.2358,	S0502890
2	.3130,.4240,.5818,.7266,10*0.0/	S0502900
.	DATA DBRDEF /115.,230.,350.,440.,500.,555.,610.,675.,750.,870.,	S0502910
1	10*0.0/, MAXNVS /10/	S0502920
.	DATA IHO/1HO/,IHP/1HP/,IHR/1HR/,IHD/1HD/,IH1/1H1/,IHC/1HC/,	S0502930
*	IHW/1HW/,IHG/1HG/,IHS/1HS/,IHT/1HT/,IHCMA/1H/,IHA/1HA/,	S0502940
*	IHH/1HH/,IHL/1HL/,IH2/1H2/,IH3/1H3/,IHM/1HM/,IHE/1HE/,	S0502950
*	IHB/1HB/,IHN/1HN/	S0502960
.	DATA IIHOP/2HOP/,IIHPR/2HPR/,IIHRE/2HRE/,IIHDI/2HDI/,IIHCO/2HCO/,	S0502970
*	IIHWA/2HWA/,IIHGR/2HGR/,IIHSH/2HSH/,IIHTI/2HTI/,IIHD2/2HD2/,	S0502980
*	IIHD3/2HD3/,IIHSI/2HSI/,IIHST/2HST/,IIHSU/2HSU/,IIHAN/2HAN/,	S0502990
*	IIHEL/2HEL/,IIHSP/2HSP/,IIHMA/2HMA/,IIHHE/2HHE/,IIHMO/2HMO/,	S0503000
*	IIHLI/2HLI/,IIHTA/2HTA/,IIHPE/2HPE/,IIHDA/2HDA/,IIHBE/2H E/,	S0503010
*	IIHBP/2H P/,IIHRR/2HRR/,IIHSO/2HSO/,IIHND/2HND/	S0503020
.	DATA IESA/15501B/,IESJ/15512B/,	S0503030
*	IESE/15505B/,IESH/15510B/,IESP/15451B/,IESD/15504B/,	S0503040
*	IESB/15502B/,INVL/62103B/,IAUN/2HA_/	S0503050
.	DATA NAMF/2H?L,2HTI,2HME/	S0503060
.	DATA NDX/2*1H /	S0503070
.	DATA JVERSN/8213/	S0503080
.		S0503090

C

C	IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S0503100
	IF (CRT) GO TO 10	S0503110
	IESA = NULL	S0503120
	IESJ = NULL	S0503130
	IESE = NULL	S0503140
	IAUN = IBLNK	S0503150
	IESH = NULL	S0503160
	IESP = NULL	S0503170
	IESD = NULL	S0503180
	IESB = NULL	S0503190
	INVBL = NULL	S0503200
	10 CONTINUE	S0503210
C		S0503220
C	-----DETERMINE ENTRY POINT.	S0503230
	NNNEST = 2	S0503240
	GOTO (20,2390,2390,2390,1620,2050,2140,1430,1530), NNNTY	S0503250
C		S0503260
C		S0503270
C	-----INITIALIZE SOME INPUT VARIABLES	S0503280
	20 CONTINUE	S0503290
	IFLG=0	S0503300
	ALPHA=1.0	S0503310
	BETA=1.0	S0503320
	DECAY=0.0	S0503330
	TIMAV=600.0	S0503340
	XRY=100.0	S0503350
	XRZ=100.0	S0503360
	XLRY=0.0	S0503370
	CALHT=0.0	S0503380
	ICALC = 1	S0503390
	LSITE=0	S0503400
		S0503410
C	DEFAULT DATA FILE NAME	S0503420
	FILE(1)=IIHRR	S0503430
	FILE(2)=IIHSO	S0503440
	FILE(3)=IIHND	S0503450
	NUMRUN=1	S0503460
	IAGAIN=0	S0503470
	TIM1 = 0.0	S0503480
	RAINRT = 0.3	S0503490
	DURAT = 1.0	S0503500
	NVS = 10	S0503510
	DO 30 I=1,NVS	S0503520
	30 VS(I) = VSDEF(I)	S0503530
C	DEFAULT ABSORPTION COEFFICIENT FOR GASES.	S0503540
	GAMMAP(21) = 0.0	S0503550
C	DEFAULT REFLECTION COEFFICIENT, FRACTION OF MATERIAL, DROP SIZE	S0503560
C	FOR AL2O3.	S0503570
	DO 40 I=1,NVS	S0503580
	GAMMAP(I) = GAMDEF(I)	S0503590
	FS(I) = FSDEF(I)	S0503600
	40 DBAR(I) = DBRDEF(I)	S0503610

KEEP = 0	S0503620
C-----WRITE THE HEADER OF THE CONSOLE	S0503630
WRITE(ICU,9025) IESE,IESH,IESJ,IESP,IAUN	S0503640
WRITE(ICU,9011) IVERSN,LOCATN	S0503650
IF (BATCH) GO TO 50	S0503660
WRITE(ICU,9012)	S0503670
IF(.NOT.CRT) WRITE (ICU,9014)	S0503680
WRITE (ICU,9021)	S0503690
50 CONTINUE	S0503700
IF(BATCH) WRITE(ICU,9013)	S0503710
C-----RUN TYPE - OPER.(=2),RESRCH(=3),PROD.(=1),DIAG.(=4)	S0503720
60 IF(BATCH) GOTO 70	S0503730
WRITE(ICU,9026) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF	S0503740
70 INPT1 = IBLNK	S0503750
READ(IIU,9001) INPT1	S0503760
IF (INPT1 .EQ. MINUS1.OR.INPT1 .EQ. MINUS9) GO TO 2420	S0503770
IF (INPT1 .EQ. IBLNK) INPT1 = IHO	S0503780
IF (INPT1 .EQ. IIHOP) INPT1 = IHO	S0503790
IF (INPT1 .EQ. IIHPR) INPT1 = IHP	S0503800
IF (INPT1 .EQ. IIHRE) INPT1 = IHR	S0503810
IF (INPT1 .EQ. IIHDI) INPT1 = IHD	S0503820
IF (INPT1.EQ.IHO.OR.INPT1.EQ.IHP) GO TO 90	S0503830
IF (BATCH) GO TO 80	S0503840
IF (INPT1.EQ.IHR.OR.INPT1.EQ.IHD) GO TO 90	S0503850
80 WRITE (ICU,9002) INV,OFF,1,0	S0503860
IF (BATCH) GO TO 2420	S0503870
GO TO 60	S0503880
90 CONTINUE	S0503890
IDXRT=6	S0503900
CALL ANSW(1,INPT,IRUN,IDXRT,IER)	S0503910
IF(BATCH .AND. IRUN .LT. 1) IRUN = 2	S0503920
IF(IRUN.LT.0) GO TO 2420	S0503930
IF(BATCH) GOTO 110	S0503940
WRITE(ICU,9027) IESA,IESJ,(RT(I),I=IDXRT,IDXRT+5)	S0503950
C-----READ IN THE MET SOUNDING DATA FILE NAME	S0503960
C USE FOUR CHARACTERS FOLLOWED BY TWO DIGITS	S0503970
100 WRITE(ICU,9028) INV,(FILE(I),I=1,3),OFF	S0503980
110 READ(IIU,9001) (INPT(I),I=1,3)	S0503990
IF(INPT1 .NE. IBLNK) GOTO 130	S0504000
DO 120 I = 1,3	S0504010
120 INPT(I) = FILE(I)	S0504020
130 IF(BATCH) GOTO 150	S0504030
IF(INPT1 .NE. MINUS1) GO TO 140	S0504040
WRITE(ICU,9003) IESCAJ,IESCAJ	S0504050
GO TO 60	S0504060
140 IF(INPT1 .EQ. MINUS9) GOTO 20	S0504070
150 IPLACE = 0	S0504080
IF(INPT1.EQ.IIHTA.AND. INPT(2).EQ.IIHPE) IPLACE = 2	S0504090
IF(INPT1.EQ.IIHDA.AND. INPT(2).EQ.IIHTA) IPLACE = 1	S0504100
IF (IPLACE .NE. 0) GO TO 170	S0504110
CALL OPEN(IDCIB,IER,INPT,1)	S0504120
IF (IER .NE. -6) GO TO 160	S0504130

WRITE (ICU,9002) INV,OFF,2,0	S0504140
WRITE (ICU,9005) INV,(INPT(I),I=1,3),OFF	S0504150
IF (BATCH) GO TO 2420	S0504160
GO TO 100	S0504170
160 CALL CLOSE(IDCIB)	S0504180
170 CONTINUE	S0504190
IF(IPLACE.EQ.0) IPLACE=3	S0504200
180 DO 190 I=1,3	S0504210
190 FILE(I)=INPT(I)	S0504220
IF(BATCH) GOTO 200	S0504230
WRITE(ICU,9029) IESA,IESJ,(FILE(J),J=1,3)	S0504240
C-----READ THE NUMBER OF RUNS (PRODUCTION MODE ONLY)	S0504250
200 IF(IRUN.NE.1) GO TO 270	S0504260
IF(BATCH) GOTO 220	S0504270
210 WRITE(ICU,9030) INV,NUMRUN,OFF	S0504280
220 INPT1=IBLNK	S0504290
CALL IFNBR(IFRMT,10,IER,IIU)	S0504300
IF (IER .EQ. 0) GO TO 240	S0504310
WRITE (ICU,9002) INV,OFF,3,0	S0504320
IF (BATCH) GO TO 2420	S0504330
GO TO 210	S0504340
230 INPT1 = IH1	S0504350
240 CALL CODE(80)	S0504360
READ (IFRMT,*) INPT1	S0504370
IF (BATCH .AND. INPT1 .LT. 1) INPT1 = 1	S0504380
IF (INPT1 .EQ. MINS9) GO TO 20	S0504390
IF (INPT1 .EQ. MINS1) GO TO 250	S0504400
IF (INPT1 .EQ. 0) INPT1 = 1	S0504410
IF (INPT1 .GT. 0) GO TO 260	S0504420
WRITE (ICU,9002) INV,OFF,3,0	S0504430
IF (BATCH) GO TO 2420	S0504440
GO TO 210	S0504450
250 WRITE(ICU,9003)IESCAJ,IESCAJ	S0504460
GOTO 100	S0504470
260 IF(INPT.GT.0.AND.INPT.LT.100) NUMRUN=INPT	S0504480
IF(BATCH) GOTO 290	S0504490
WRITE(ICU,9031) IESA,IESJ,NUMRUN	S0504500
270 CONTINUE	S0504510
C-----MODEL TO BE USED	S0504520
IF(BATCH) GOTO 290	S0504530
280 WRITE(ICU,9032) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF	S0504540
290 INPT1 = IBLNK	S0504550
READ(IIU,9001) INPT1	S0504560
IDXLV = 12	S0504570
300 IF (INPT1 .EQ. IBLNK.OR.INPT1 .EQ. IIHCO) INPT1 = IHC	S0504580
IF (INPT1 .EQ. IIHWA) INPT1 = IHW	S0504590
IF (INPT1 .EQ. IIHGR) INPT1 = IHG	S0504600
IF (INPT1 .EQ. MINUS1) GO TO 320	S0504610
IF (INPT1 .EQ. MINUS9) GO TO 20	S0504620
IF (INPT1.EQ.IHC.OR.INPT1.EQ.IHW.OR.INPT1.EQ.IHG) GO TO 310	S0504630
WRITE (ICU,9002) INV,OFF,4,0	S0504640
IF (BATCH) GO TO 2420	S0504650

GO TO 280	S0504660
310 CONTINUE	S0504670
CALL ANSW(11,INPT,MODEL,IDXLV,IER)	S0504680
GO TO 330	S0504690
320 WRITE(ICU,9003) IESCAJ,IESCAJ	S0504700
IF (IRUN .EQ. 1) GO TO 200	S0504710
GO TO 100	S0504720
330 DO 340 I = 1,12	S0504730
340 MDLNAM(I) = LMODEL(I,MODEL)	S0504740
MODEL = MODEL + 3	S0504750
MODEL4 = MODEL .EQ. 4	S0504760
MODEL5 = MODEL .EQ. 5	S0504770
MODEL6 = MODEL .EQ. 6	S0504780
IF(BATCH) GOTO 350	S0504790
WRITE(ICU,9033) IESA,IESJ,MDLNAM	S0504800
C-----GET SYSTEM TIME AND DATE	S0504810
350 CALL FTIME(IFRMT)	S0504820
CALL CODE(80)	S0504830
READ (IFRMT,9022) INPT1,JTIME,JDAY,JMON,JYEAR	S0504840
JTIME = INPT1*100+JTIME	S0504850
360 LSDT(1) = IIHBE	S0504860
LSDT(2) = IIHST	S0504870
CALL CODE	S0504880
WRITE (IFRMT,9004) JTIME,(LSDT(I),I=1,2),JDAY,JMON,JYEAR	S0504890
C-----READ IN THE LAUNCH TIME AND DATE	S0504900
CALL OPEN(IDCB,IER,NAMF,1)	S0504910
IF (IER .NE. -6) GO TO 370	S0504920
WRITE (ICU,9007) NAMF	S0504930
GO TO 390	S0504940
370 IF (IER .GE. 0) GO TO 380	S0504950
WRITE (ICU,9008) NAMF	S0504960
GO TO 390	S0504970
380 CALL READF(IDCB,IER,IFRMT)	S0504980
CALL CLOSE(IDCB)	S0504990
390 CONTINUE	S0505000
CALL CODE(20)	S0505010
READ(IFRMT,9004) LTIME,LSDT(1),LSDT(2),LDAY,LMON(1),LMON(2),LYEAR	S0505020
IF(IPLACE.EQ.1) LSDT(1)=IIHBP	S0505030
IF(BATCH) GOTO 400	S0505040
WRITE(ICU,9034) INV,LTIME,(LSDT(I),I=1,2),LDAY,(LMON(I),I=1,2),	S0505050
*LYEAR,OFF,IESB,(IESD,I=1,22)	S0505060
400 CALL IFNBR(IFRMT,-1,IER,IIU)	S0505070
IF (IER .EQ. 0) GO TO 420	S0505080
410 WRITE (ICU,9002) INV,OFF,5,0	S0505090
IF (BATCH) GO TO 2420	S0505100
GO TO 360	S0505110
420 INPT(1) = 0	S0505120
INPT(4) = 0	S0505130
INPT(7) = 0	S0505140
INPT(2) = IBLNK	S0505150
INPT(3) = IBLNK	S0505160
INPT(5) = IBLNK	S0505170

INPT(6) = IBLNK	S0505180
CALL CODE(80)	S0505190
READ (IFRMT,9004) (INPT(I),I=1,7)	S0505200
IF (IFRMT(1) .EQ. MINUS1) GO TO 430	S0505210
IF (IFRMT(1) .EQ. MINUS9) GO TO 20	S0505220
IF (INPT1 .GE. 0) GO TO 440	S0505230
GO TO 410	S0505240
430 WRITE(ICU,9003) (IESCAJ,I=1,3)	S0505250
GOTO 280	S0505260
440 IF(INPT1.GT.0) LTIME = INPT1	S0505270
IF (INPT(2).EQ. IBLNK.AND. INPT(3).EQ. IBLNK) GO TO 450	S0505280
LSDT(1) = INPT(2)	S0505290
LSDT(2) = INPT(3)	S0505300
450 IF (INPT(4) .GT. 0) LDAY = INPT(4)	S0505310
IF (INPT(5).EQ. IBLNK.AND. INPT(6).EQ. IBLNK) GO TO 460	S0505320
LMON(1) = INPT(5)	S0505330
LMON(2) = INPT(6)	S0505340
460 IF (INPT(7) .GT. 0) LYEAR = INPT(7)	S0505350
470 DO 480 I=1,12	S0505360
IF(LMON(1).EQ. MONTHS(2*I-1).AND. LMON(2).EQ. MONTHS(2*I)) GO TO 490	S0505370
480 CONTINUE	S0505380
WRITE(ICU,9035) IESA, (IESD,I=1,11)	S0505390
GO TO 400	S0505400
490 MMON=I	S0505410
IF(BATCH) GOTO 510	S0505420
WRITE(ICU,9036) IESA, IESA, IESJ, LTIME, LSDT(1), LSDT(2), LDAY, LMON(1),	S0505430
*LMON(2), LYEAR	S0505440
C-----READ IN THE LAUNCH VEHICLE	S0505450
C AND FILL THE VPAR ARRAY WITH THE	S0505460
C APPROPRIATE VEHICLE PARAMETERS	S0505470
500 WRITE(ICU,9037) INVNDR, INV, OFF, ULINE, OFF, ULINE, OFF, ULINE, OFF,	S0505480
*ULINE, OFF, ULINE, OFF	S0505490
510 DO 520 I=1,10	S0505500
520 INPT(I) = IBLNK	S0505510
READ(IIU,9001) INPT	S0505520
IF(BATCH .OR. INPT1 .NE. MINUS1) GOTO 530	S0505530
WRITE(ICU,9003) IESCAJ, IESCAJ	S0505540
GOTO 360	S0505550
530 IF (INPT1 .EQ. IBLNK.OR. INPT1 .EQ. IIHSH) INPT1 = IHS	S0505560
IF (INPT1 .EQ. IIHT1) INPT1 = IHT	S0505570
IF (INPT1 .EQ. MINUS9) GO TO 20	S0505580
IF (INPT1.EQ. IHS.OR. INPT1.EQ. IHT.OR. INPT1.EQ. IIHD2.OR. INPT1.EQ.	S0505590
*IIHD3) GO TO 630	S0505600
CALL CODE(20)	S0505610
READ (INPT,9006) (IFRMT(I),I=1,10)	S0505620
J = 0	S0505630
I = 0	S0505640
540 I = I+1	S0505650
IF (I .GT. 10) GO TO 620	S0505660
IF (IFRMT(I) .EQ. IBLNK.AND. J .EQ. 0) GO TO 540	S0505670
J = J+1	S0505680
GO TO (550,560,570,580,590,600),J	S0505690

550 IF (IFRMT(I) .EQ. IHD) GO TO 540	S0505700
GO TO 620	S0505710
560 IF (IFRMT(I) .EQ. IHE) GO TO 540	S0505720
GO TO 620	S0505730
570 IF (IFRMT(I) .EQ. IHL) GO TO 540	S0505740
GO TO 620	S0505750
580 IF (IFRMT(I) .EQ. IHT) GO TO 540	S0505760
GO TO 620	S0505770
590 IF (IFRMT(I) .EQ. IHA) GO TO 540	S0505780
GO TO 620	S0505790
600 IF (IFRMT(I) .EQ. IH2) GO TO 610	S0505800
IF (IFRMT(I) .NE. IH3) GO TO 620	S0505810
INPT1 = IIHD3	S0505820
GO TO 530	S0505830
610 INPT1 = IIHD2	S0505840
GO TO 530	S0505850
620 CONTINUE	S0505860
WRITE (ICU,9002) INV,OFF,6,0	S0505870
IF (BATCH) GO TO 2420	S0505880
GO TO 500	S0505890
630 IDXLV=7	S0505900
CALL ANSW(2,INPT,IVHICL,IDXLV,IER)	S0505910
IF(BATCH) GOTO 640	S0505920
WRITE(ICU,9038) IESA,IESJ,(LV(I),I=IDXLV,IDXLV+6)	S0505930
640 IDX=IDXLV	S0505940
DO 650 I=1,7	S0505950
TITLE(I)=LV(IDX)	S0505960
650 IDX=IDX+1	S0505970
I=IVHICL	S0505980
DO 660 J=1,17	S0505990
660 VPAR(J) = VPARS(J,I)	S0506000
C-----LAUNCH TYPE (NORMAL,SINGLE ENGINE,CONFLAGRATION)	S0506010
670 IF(BATCH) GOTO 680	S0506020
WRITE(ICU,9039) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF	S0506030
680 INPT1 = IBLNK	S0506040
READ(IIU,9001) INPT1	S0506050
IF(BATCH .OR. INPT1 .NE. MINUS1) GOTO 690	S0506060
WRITE(ICU,9003) IESCAJ,IESCAJ	S0506070
GOTO 500	S0506080
690 IF (INPT1 .EQ. IBLNK.OR.INPT1 .EQ. INOJ) INPT1 = INJ	S0506090
IF (INPT1 .EQ. IIHSI) INPT1 = IHS	S0506100
IF (INPT1 .EQ. IIHCO) INPT1 = IHC	S0506110
IF (INPT1 .EQ. MINUS9) GO TO 20	S0506120
IF (INPT1.EQ.INJ.OR.INPT1.EQ.IHS.OR.INPT1.EQ.IHC) GO TO 700	S0506130
WRITE (ICU,9002) INV,OFF,7,0	S0506140
IF (BATCH) GO TO 2420	S0506150
GO TO 670	S0506160
700 IDXLT=7	S0506170
CALL ANSW(3,INPT,NORMAL,IDXLT,IER)	S0506180
IF(BATCH) GOTO 710	S0506190
WRITE(ICU,9040) IESA,IESJ,(LT(I),I=IDXLT,IDXLT+6)	S0506200
710 IDX=IDXLT	S0506210

DO 720 I=1,7	S0506220
JDX=I+7	S0506230
TITLE(JDX)=LT(IDX)	S0506240
720 IDX=IDX+1	S0506250
C-----VEHICLE PROPELLANT TEMPERATURE	S0506260
730 RNPT=0.0	S0506270
TPROP=AVTMP(MMON)	S0506280
IF(BATCH) GOTO 740	S0506290
WRITE(ICU,9041) INV,TPROP,OFF	S0506300
740 CALL IFNBR(IFRMT,14,IER,IIU)	S0506310
IF (IER .EQ. 0) GO TO 750	S0506320
WRITE (ICU,9002) INV,OFF,8,0	S0506330
IF (BATCH) GO TO 2420	S0506340
GO TO 730	S0506350
750 CALL CODE(80)	S0506360
READ (IFRMT,*) RNPT	S0506370
IF(BATCH .AND. RNPT .LT. 0.0) RNPT = 0.0	S0506380
IF (RNPT .EQ. MINS1) GO TO 760	S0506390
IF (RNPT .EQ. MINS9) GO TO 20	S0506400
IF (RNPT .GE. 0.0) GO TO 770	S0506410
WRITE (ICU,9002) INV,OFF,8,0	S0506420
GO TO 730	S0506430
760 WRITE(ICU,9003) IESCAJ,IESCAJ	S0506440
GOTO 670	S0506450
770 IF(RNPT.GT.0.0) TPROP=RNPT	S0506460
IF(BATCH) GOTO 780	S0506470
WRITE(ICU,9042) IESA,IESJ,TPROP	S0506480
780 TPROPC=TPROP	S0506490
TPROP=TPROP+273.16	S0506500
IF(MODEL6) GOTO 1010	S0506510
C-----SPECIES TO COMPUTE CONCENTRATIONS AND DEPOSITIONS FOR	S0506520
790 DO 800 I=1,12	S0506530
ICHAR(I) = IBLNK	S0506540
IF (I .GT. 4) GO TO 800	S0506550
IPLNT(I) = 0	S0506560
800 CONTINUE	S0506570
IF (BATCH) GO TO 830	S0506580
IF (MODEL4) GO TO 810	S0506590
WRITE (ICU,9082) INVNDR,INV,OFF,ULINE,OFF	S0506600
GO TO 820	S0506610
810 WRITE (ICU,9043) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF,ULINE,OFF,	S0506620
*ULINE,OFF	S0506630
820 CONTINUE	S0506640
830 CALL IFNBR(IFRMT,20,IER,IIU)	S0506650
IF (BATCH) GO TO 850	S0506660
IF (IFRMT(1) .NE. MINUS1) GO TO 840	S0506670
WRITE (ICU,9003) IESCAJ,IESCAJ	S0506680
GO TO 730	S0506690
840 IF (IFRMT(1) .EQ. MINUS9) GO TO 20	S0506700
850 JJ = 1	S0506710
I = 20	S0506720
IF (IER .NE. 0) GO TO 860	S0506730

IPLLNT(1) = 1	S0506740
GO TO 980	S0506750
860 DO 870 I=40,60	S0506760
870 IFRMT(I) = IBLNK	S0506770
CALL CODE(80)	S0506780
READ (IFRMT,9006) (IFRMT(I+39),I=1,20)	S0506790
I = 0	S0506800
880 I = I+1	S0506810
IF (I .GT. 20) GO TO 1000	S0506820
IF (IFRMT(39+I) .EQ. IBLNK.OR.IFRMT(39+I) .EQ. IHCMA) GO TO 880	S0506830
IF (IFRMT(39+I) .EQ. IHC) GO TO 940	S0506840
IF (IFRMT(39+I) .EQ. IHA) GO TO 910	S0506850
IF (IFRMT(39+I) .EQ. IHH) GO TO 890	S0506860
WRITE (ICU,9002) INV,OFF,9,0	S0506870
IF (BATCH) GO TO 2420	S0506880
GO TO 790	S0506890
890 IPLLNT(JJ) = 1	S0506900
900 IF (IFRMT(40+I).NE.IHC.AND.IFRMT(40+I).NE.IHL) GO TO 980	S0506910
I = I+1	S0506920
GO TO 900	S0506930
910 IPLLNT(JJ) = 4	S0506940
920 IF (IFRMT(40+I).EQ.IHL.OR.IFRMT(40+I).EQ.IH2) GO TO 930	S0506950
IF (IFRMT(40+I).NE.IHO.AND.IFRMT(40+I).NE.IH3) GO TO 980	S0506960
930 I = I+1	S0506970
GO TO 920	S0506980
940 IF (IFRMT(40+I) .EQ. IHO) GO TO 970	S0506990
IF (IFRMT(40+I) .EQ. IH2) GO TO 960	S0507000
950 IPLLNT(JJ) = 3	S0507010
GO TO 980	S0507020
960 I = I+1	S0507030
IPLLNT(JJ) = 2	S0507040
GO TO 980	S0507050
970 I = I+1	S0507060
IF (IFRMT(40+I) .EQ. IH2) GO TO 960	S0507070
GO TO 950	S0507080
980 JJJ = JJ*3-3	S0507090
III = IPLLNT(JJ)*3-3	S0507100
DO 990 J=1,3	S0507110
990 ICHAR(J+JJJ) = SP(J+III)	S0507120
JJ = JJ+1	S0507130
GO TO 880	S0507140
1000 CONTINUE	S0507150
IF (JJ .EQ. 1.AND.IPLLNT(JJ) .EQ. 0) GO TO 850	S0507160
IF(BATCH) GOTO 1010	S0507170
WRITE(ICU,9044) IESA,IESJ,((ICHAR(I+12-3*J),I=1,3),J=1,4)	S0507180
C-----ENTER ENTRAINMENT PARAMETERS	S0507190
1010 CONTINUE	S0507200
IF(NORMAL.EQ.1) GO TO 1020	S0507210
GAMMAX=GAMMAC	S0507220
GAMMAY=GAMMAC	S0507230
GAMMAZ=GAMMAC	S0507240
GO TO 1030	S0507250

1020	GAMMAX=GAMMAI	S0507260
	GAMMAY=GAMMAI	S0507270
	GAMMAZ=GAMMAI	S0507280
1030	CONTINUE	S0507290
	IF(IRUN.LT.3) GO TO 1280	S0507300
1040	WRITE(ICU,9045) GAMMAX,GAMMAY,GAMMAZ,INVNDR,INV,OFF,ULINE,OFF	S0507310
	INPT1 = IBLNK	S0507320
	READ(IIU,9001) INPT1	S0507330
	IF(INPT1 .NE. MINUS1) GOTO 1050	S0507340
	WRITE(ICU,9003) IESCAJ,IESCAJ	S0507350
	IF(MODEL6) GOTO 730	S0507360
	GOTO 790	S0507370
1050	IF(INPT1 .EQ. MINUS9) GOTO 20	S0507380
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 1270	S0507390
	IF (INPT1 .EQ. IYSJ.OR.INPT1.EQ.IYESJ) GO TO 1060	S0507400
	WRITE (ICU,9002) INV,OFF,9,1	S0507410
	IF (BATCH) GO TO 2420	S0507420
	GO TO 1040	S0507430
1060	IF (BATCH) GO TO 1080	S0507440
	WRITE(ICU,9046) IESA,IESJ,GAMMAX	S0507450
1070	WRITE(ICU,9047) IESA,IESJ,INV,GAMMAX,OFF	S0507460
1080	RNPT=0.0	S0507470
	CALL IFNBR(IFRMT,14,IER,IIU)	S0507480
	IF (IER .EQ. 0) GO TO 1100	S0507490
1090	WRITE (ICU,9002) INV,OFF,9,2	S0507500
	IF (BATCH) GO TO 2420	S0507510
	GO TO 1070	S0507520
1100	CALL CODE(80)	S0507530
	READ (IFRMT,*) RNPT	S0507540
	IF (RNPT .EQ. MINS1) GO TO 1110	S0507550
	IF (RNPT .EQ. MINS9) GO TO 20	S0507560
	IF (RNPT .GE. 0.0) GO TO 1120	S0507570
	GO TO 1090	S0507580
1110	WRITE(ICU,9003) IESCAJ	S0507590
	GOTO 1040	S0507600
1120	IF(RNPT.GT.0.0) GAMMAX=RNPT	S0507610
1130	IF (BATCH) GO TO 1140	S0507620
	WRITE(ICU,9048) IESA,IESJ,INV,GAMMAY,OFF	S0507630
1140	RNPT=0.0	S0507640
	CALL IFNBR(IFRMT,14,IER,IIU)	S0507650
	IF (IER .EQ. 0) GO TO 1160	S0507660
1150	WRITE (ICU,9002) INV,OFF,9,3	S0507670
	IF (BATCH) GO TO 2420	S0507680
	GO TO 1130	S0507690
1160	CALL CODE(80)	S0507700
	READ (IFRMT,*) RNPT	S0507710
	IF (RNPT .EQ. MINS1) GO TO 1070	S0507720
	IF (RNPT .EQ. MINS9) GO TO 20	S0507730
	IF (RNPT .GE. 0.0) GO TO 1170	S0507740
	GO TO 1150	S0507750
1170	IF(RNPT.GT.0.0) GAMMAY=RNPT	S0507760
1180	IF (BATCH) GO TO 1190	S0507770

WRITE(ICU,9049) IESA,IESJ,INV,GAMMAZ,OFF	S0507780
1190 RNPT=0.0	S0507790
CALL IFNBR(IFRMT,14,IER,IIU)	S0507800
IF (IER .EQ. 0) GO TO 1210	S0507810
1200 WRITE (ICU,9002) INV,OFF,9,4	S0507820
IF (BATCH) GO TO 2420	S0507830
GO TO 1180	S0507840
1210 CALL CODE(80)	S0507850
READ (IFRMT,*) RNPT	S0507860
IF (RNPT .EQ. MINS1) GO TO 1130	S0507870
IF (RNPT .EQ. MINS9) GO TO 20	S0507880
IF (RNPT .GE. 0.0) GO TO 1220	S0507890
GO TO 1200	S0507900
1220 IF(RNPT.GT.0) GAMMAZ=RNPT	S0507910
C-----CHECK PRODUCT OF GAMMA'S	S0507920
IF(NORMAL.GT.1) GO TO 1230	S0507930
PROD=ABS(GAMMAX*GAMMAY*GAMMAZ-.26214)	S0507940
GO TO 1240	S0507950
1230 PROD=ABS(GAMMAX*GAMMAY-.25)	S0507960
1240 CONTINUE	S0507970
IF(BATCH .OR. PROD.LE..0001) GO TO 1270	S0507980
1250 WRITE(ICU,9050) INVNDR,INV,OFF,ULINE,OFF	S0507990
INPT1 = IBLNK	S0508000
READ(IIU,9001) INPT1	S0508010
IF(INPT1 .NE. MINUS1) GOTO 1260	S0508020
WRITE(ICU,9003) IESCAJ,IESCAJ	S0508030
GOTO 1070	S0508040
1260 IF(INPT1 .EQ. MINUS9) GOTO 20	S0508050
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 1270	S0508060
IF (INPT1 .EQ. INJ.OR.INPT1 .EQ. INOJ) GO TO 1070	S0508070
WRITE (ICU,9002) INV,OFF,0,0	S0508080
GO TO 1250	S0508090
1270 CONTINUE	S0508100
WRITE(ICU,9051) IESA,IESJ,GAMMAX,GAMMAY,GAMMAZ	S0508110
1280 CONTINUE	S0508120
C-----ENTER LAUNCH COMPLEX NUMBER	S0508130
1290 CONTINUE	S0508140
DO 1300 I=1,6	S0508150
IFRMT(I*2-1) = ULINE(1)	S0508160
1300 IFRMT(I*2) = ULINE(2)	S0508170
GO TO (1310,1320,1330,1330) IVHICL	S0508180
1310 LDX=18	S0508190
MDX=IHS	S0508200
NDX(1) = LC(1)	S0508210
NDX(2) = IHA	S0508220
IFRMT(1) = INVNDR(1)	S0508230
IFRMT(2) = INVNDR(2)	S0508240
GO TO 1340	S0508250
1320 LDX=30	S0508260
MDX=IHT	S0508270
NDX(1) = LC(7)	S0508280
NDX(2)=IBLNK	S0508290

IFRMT(7) = INVNDR(1)	S0508300
IFRMT(8) = INVNDR(2)	S0508310
GO TO 1340	S0508320
1330 LDX=24	S0508330
MDX=IHD	S0508340
NDX(1) = LC(11)	S0508350
NDX(2)=IBLNK	S0508360
IFRMT(11) = INVNDR(1)	S0508370
IFRMT(12) = INVNDR(2)	S0508380
1340 CONTINUE	S0508390
IF(.NOT.BATCH) WRITE(ICU,9052) (IFRMT(I*2-1),IFRMT(I*2),OFF,I=1,6)	S0508400
INPT(1) = IBLNK	S0508410
INPT(2) = IBLNK	S0508420
READ(IIU,9001) INPT	S0508430
IF(BATCH .OR. INPT1 .NE. MINUS1) GOTO 1350	S0508440
WRITE(ICU,9003) IESCAJ,IESCAJ	S0508450
IF (IRUN .LT. 3) GO TO 790	S0508460
GO TO 1040	S0508470
1350 IF (INPT1 .EQ. MINUS9) GO TO 20	S0508480
IF(INPT1.NE.IBLNK) GO TO 1360	S0508490
INPT(1) = NDX(1)	S0508500
INPT(2) = NDX(2)	S0508510
1360 LSITE = 1	S0508520
CALL ANSW(5,INPT,IDX,LSITE,IER)	S0508530
IF (IER .EQ. 0) GO TO 1380	S0508540
1370 IF (BATCH) GO TO 2420	S0508550
WRITE (ICU,9002) INV,OFF,10,0	S0508560
GO TO 1290	S0508570
1380 IF (LSITE .GT. 1) LSITE = LSITE+2	S0508580
IF (LSITE .GT. 1) GO TO 1390	S0508590
I = 0	S0508600
IF (INPT(2) .EQ. IHA.OR.INPT(2) .EQ. IBLNK) I = 1	S0508610
IF (INPT(2) .EQ. IHB) I = 2	S0508620
IF (INPT(2) .EQ. IHC) I = 3	S0508630
IF (I .EQ. 0) GO TO 1370	S0508640
LSITE = I	S0508650
1390 CONTINUE	S0508660
IF (BATCH) GO TO 1430	S0508670
IF (IER .EQ. 0.AND.MDX.EQ. IDX) GO TO 1420	S0508680
1400 WRITE(ICU,9053) IESA,IESJ,INPT(1),INPT(2),INVNDR,INV,OFF,ULINE,OFFS	S0508690
INPT1 = IBLNK	S0508700
READ(IIU,9001) INPT1	S0508710
IF(INPT1.NE.MINUS1) GOTO 1410	S0508720
WRITE(ICU,9003) IESCAJ	S0508730
GOTO 1290	S0508740
1410 IF(INPT1.EQ.MINUS9) GOTO 20	S0508750
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 1420	S0508760
IF (INPT1 .EQ. INJ.OR.INPT1 .EQ. INOJ) GO TO 1290	S0508770
WRITE (ICU,9002) INV,OFF,0,0	S0508780
GO TO 1400	S0508790
1420 CONTINUE	S0508800
WRITE(ICU,9054) IESA,IESJ,LC(LSITE*2-1),LC(LSITE*2)	S0508810

1430 IF(.NOT.MODEL4) GOTO 1610	S0508820
C-----ENTER CALCULATION LOCATION (SURFACE,STABILIZATION,USER INPUTS	S0508830
IF(.NOT.BATCH) GOTO 1440	S0508840
INPT(1) = IBLNK	S0508850
INPT(2) = IBLNK	S0508860
INPT(3) = IBLNK	S0508870
INPT(4) = IBLNK	S0508880
INPT(5) = IBLNK	S0508890
READ(IIU,9001) INPT	S0508900
IF(INPT1.EQ.IHS .OR. INPT1.EQ.IIHST .OR. INPT1.EQ.IBLNK) GOTO 1460	S0508910
CALHT = 0.0	S0508920
CALL CODE(20)	S0508930
READ(INPT,*) CALHT	S0508940
ICALC = 3	S0508950
CALHT = AMAX1(0.0,CALHT)	S0508960
IF(IAGAIN .EQ. 1) GOTO 2400	S0508970
GOTO 1620	S0508980
1440 WRITE(ICU,9055) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF	S0508990
INPT1 = IBLNK	S0509000
READ(IIU,9001) INPT1	S0509010
IF(INPT1 .NE. MINUS1) GOTO 1460	S0509020
1450 WRITE(ICU,9003) IESCAJ,IESCAJ	S0509030
GOTO 1290	S0509040
1460 IDXCL=7	S0509050
IF (INPT1 .EQ. MINUS9) GO TO 20	S0509060
IF (INPT1 .EQ. IBLNK.OR.INPT1 .EQ. IIHSU) INPT1 = IHS	S0509070
IF (INPT1 .EQ. IIHAN) INPT1 = IHA	S0509080
CALL ANSW(6,INPT,ICALC,IDXCL,IER)	S0509090
IF (IER .EQ. 0) GO TO 1470	S0509100
WRITE (ICU,9002) INV,OFF,11,0	S0509110
GO TO 1440	S0509120
1470 IF (ICALC .NE. 2) GO TO 1520	S0509130
DO 1480 I=1,4	S0509140
IF (IPLNT(I) .EQ. 4) GO TO 1490	S0509150
1480 CONTINUE	S0509160
GO TO 1520	S0509170
1490 WRITE (ICU,9023)	S0509180
C DO YOU WISH TO ENTER A DIFFERENT CALCULATION HEIGHT?	S0509190
1500 WRITE (ICU,9024) INVNDR,INV,OFF,ULINE,OFF	S0509200
INPT1 = IBLNK	S0509210
READ (IIU,9001) INPT1	S0509220
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 1430	S0509230
IF (INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 1510	S0509240
IF (INPT1 .EQ. MINUS1) GO TO 1450	S0509250
IF (INPT1 .EQ. MINUS9) GO TO 20	S0509260
WRITE (ICU,9002) INV,OFF,24,0	S0509270
IF (BATCH) GO TO 2420	S0509280
GO TO 1500	S0509290
1510 CONTINUE	S0509300
1520 CONTINUE	S0509310
IF(ICALC.EQ.3) GO TO 1530	S0509320
IF(.NOT.BATCH)WRITE(ICU,9056) IESA,IESJ,(CL(I),I=IDXCL,IDXCL+6)	S0509330

GO TO 1620	S0509340
C-----ENTER CALCULATION HEIGHT CALHT	S0509350
1530 WRITE(ICU,9057) IESA,IESJ,INV,CALHT,OFF	S0509360
RNPT=CALHT	S0509370
CALL IFNBR(IFRMT,14,IER,IIU)	S0509380
IF (IER .EQ. 0) GO TO 1550	S0509390
1540 WRITE (ICU,9002) INV,OFF,11,1	S0509400
GO TO 1530	S0509410
1550 CALL CODE(80)	S0509420
READ (IFRMT,*) RNPT	S0509430
IF (RNPT .EQ. MINS1) GO TO 1560	S0509440
IF (RNPT .EQ. MINS9) GO TO 20	S0509450
IF (RNPT .GE. 0.0) GO TO 1570	S0509460
GO TO 1540	S0509470
1560 IF(IAGAIN .EQ. 1) GOTO 2410	S0509480
WRITE(ICU,9003) IESCAJ	S0509490
GOTO 1430	S0509500
1570 CALHT=RNPT	S0509510
WRITE(ICU,9058) IESA,IESJ,CALHT	S0509520
DO 1580 I=1,4	S0509530
IF (IPLNT(I) .EQ. 4) GO TO 1590	S0509540
1580 CONTINUE	S0509550
GO TO 1610	S0509560
1590 IF (CALHT .LE. 5.0) GO TO 1610	S0509570
WRITE (ICU,9023)	S0509580
C DO YOU WISH TO ENTER A DIFFERENT CALCULATION HEIGHT?	S0509590
1600 WRITE (ICU,9024) INVNDR,INV,OFF,ULINE,OFF	S0509600
INPT1 = IBLNK	S0509610
READ (IIU,9001) INPT1	S0509620
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 1430	S0509630
IF (INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 1610	S0509640
IF (INPT1 .EQ. MINUS1) GO TO 1450	S0509650
IF (INPT1 .EQ. MINUS9) GO TO 20	S0509660
WRITE (ICU,9002) INV,OFF,24,0	S0509670
IF (BATCH) GO TO 2420	S0509680
GO TO 1600	S0509690
1610 IF(IAGAIN.EQ.1) GO TO 2400	S0509700
1620 CONTINUE	S0509710
C-----ENTER CLOUD SHAPE	S0509720
NNTRY = 1	S0509730
IF(BATCH) GOTO 1630	S0509740
WRITE(ICU,9059) INVNDR,INV,OFF,ULINE,OFF	S0509750
1630 INPT1 = IBLNK	S0509760
READ(IIU,9001) INPT1	S0509770
IF(BATCH .OR. INPT1.NE.MINUS1) GOTO 1640	S0509780
WRITE(ICU,9003) IESCAJ,IESCAJ	S0509790
IF (MODEL .NE. 4) GO TO 1290	S0509800
GOTO 1430	S0509810
1640 IF (INPT1 .EQ. MINUS9) GO TO 20	S0509820
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IIHEL) INPT1 = IHE	S0509830
IF (INPT1 .EQ. IIHSP) INPT1 = IHS	S0509840
IDXCS=5	S0509850

CALL ANSW(7,INPT,ISHAPE,IDXCS,IER)	S0509860
IF(.NOT.BATCH .OR. ISHAPE .GT. 0) GOTO 1650	S0509870
ISHAPE = 1	S0509880
IDXCS = 5	S0509890
1650 CONTINUE	S0509900
IF (IER .EQ. 0) GO TO 1660	S0509910
WRITE (ICU,9002) INV,OFF,12,0	S0509920
IF (BATCH) GO TO 2420	S0509930
GO TO 1620	S0509940
1660 IF (BATCH) GO TO 1670	S0509950
WRITE(ICU,9060) IESA,IESJ,(CS(I),I=IDXCS,IDXCS+4)	S0509960
C-----DETERMINE IF GRAVITATIONAL SETTLING OCCURS.	S0509970
1670 GASSET = .FALSE.	S0509980
GRVSET = .FALSE.	S0509990
IF(MODEL5) GOTO 1690	S0510000
GRVSET = .TRUE.	S0510010
IF(MODEL6) GOTO 1690	S0510020
DO 1680 I = 1,4	S0510030
IF(IPLNT(I) .EQ. 4) GOTO 1690	S0510040
GASSET = .TRUE.	S0510050
1680 CONTINUE	S0510060
GRVSET = .FALSE.	S0510070
C-----CHECK FOR PRODUCTION OR OPERATIONAL MODE.	S0510080
1690 IF (IRUN .LT. 3) GO TO 2390	S0510090
C-----ENTER ABSORPTION COEFFICIENT	S0510100
IF (MODEL5) GOTO 1810	S0510110
IF(.NOT. MODEL4 .OR. .NOT. GASSET) GOTO 1750	S0510120
1700 WRITE(ICU,9061) INV,OFF	S0510130
RNPT = GAMMAP(21)	S0510140
CALL IFNBR(IFRMT,14,IER,IIU)	S0510150
IF (IER .EQ. 0) GO TO 1720	S0510160
1710 WRITE (ICU,9002) INV,OFF,12,1	S0510170
IF (BATCH) GO TO 2420	S0510180
GO TO 1700	S0510190
1720 CALL CODE(80)	S0510200
READ (IFRMT,*) RNPT	S0510210
IF (RNPT .EQ. MINS1) GO TO 1730	S0510220
IF (RNPT .EQ. MINS9) GO TO 20	S0510230
IF (RNPT .GE. 0.0.AND.RNPT .LE. 1.0) GO TO 1740	S0510240
GO TO 1710	S0510250
1730 WRITE(ICU,9003) IESCAJ,IESCAJ	S0510260
GOTO 1620	S0510270
1740 IF(RNPT.GE.0.0.AND.RNPT.LE.1.0) GAMMAP(21)=RNPT	S0510280
WRITE(ICU,9062) IESA,IESJ,GAMMAP(21)	S0510290
C-----ENTER DECAY COEFFICIENT	S0510300
1750 IF(.NOT.MODEL4) GOTO 1810	S0510310
1760 WRITE(ICU,9063) INV,OFF	S0510320
RNPT=0.0	S0510330
CALL IFNBR(IFRMT,14,IER,IIU)	S0510340
IF (IER .EQ. 0) GO TO 1780	S0510350
1770 WRITE (ICU,9002) INV,OFF,12,2	S0510360
IF (BATCH) GO TO 2420	S0510370

GO TO 1760	S0510380
1780 CALL CODE(80)	S0510390
READ (IFRMT,*) RNPT	S0510400
IF (RNPT .EQ. MINS9) GO TO 20	S0510410
IF (RNPT .EQ. MINS1) GO TO 1790	S0510420
IF (RNPT .GE. 0.0) GO TO 1800	S0510430
GO TO 1770	S0510440
1790 WRITE(ICU,9003) IESCAJ,IESCAJ	S0510450
IF(GRVSET) GOTO 1620	S0510460
GOTO 1700	S0510470
1800 IF(RNPT.GT.0.0) DECAY=RNPT	S0510480
WRITE(ICU,9064) IESA,IESJ,DECAY	S0510490
C-----ENTER ALPHA AND BETA	S0510500
1810 WRITE(ICU,9065) ALPHA,BETA,INVNDR,INV,OFF,ULINE,OFF	S0510510
INPT1 = IBLNK	S0510520
READ(IIU,9001) INPT1	S0510530
IF(INPT1 .NE. MINUS1) GOTO 1820	S0510540
WRITE (ICU,9003) IESCAJ,IESCAJ	S0510550
IF(MODEL5) GOTO 1620	S0510560
IF(.NOT.MODEL4) GOTO 1700	S0510570
GOTO 1760	S0510580
1820 IF(INPT1 .EQ. MINUS9) GOTO 20	S0510590
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 1920	S0510600
IF (INPT1 .EQ. IYSJ.OR.INPT1 .EQ. IYESJ) GO TO 1830	S0510610
WRITE (ICU,9002) INV,OFF,12,3	S0510620
GO TO 1810	S0510630
1830 WRITE(ICU,9066) IESA,IESJ	S0510640
RNPT=0.0	S0510650
CALL IFNBR(IFRMT,14,IER,IIU)	S0510660
IF (IER .EQ. 0) GO TO 1850	S0510670
1840 WRITE (ICU,9002) INV,OFF,12,4	S0510680
IF (BATCH) GO TO 2420	S0510690
GO TO 1830	S0510700
1850 CALL CODE(80)	S0510710
READ (IFRMT,*) RNPT	S0510720
IF (RNPT .EQ. MINS1) GO TO 1860	S0510730
IF (RNPT .EQ. MINS9) GO TO 20	S0510740
IF (RNPT .GE. 0.0) GO TO 1870	S0510750
GO TO 1840	S0510760
1860 WRITE(ICU,9003) IESCAJ	S0510770
GOTO 1810	S0510780
1870 IF(RNPT.GT.0.0) ALPHA=RNPT	S0510790
1880 WRITE(ICU,9067) IESA,IESJ	S0510800
RNPT=0.0	S0510810
CALL IFNBR(IFRMT,14,IER,IIU)	S0510820
IF (IER .EQ. 0) GO TO 1900	S0510830
1890 WRITE (ICU,9002) INV,OFF,12,5	S0510840
IF (BATCH) GO TO 2420	S0510850
GO TO 1880	S0510860
1900 CALL CODE(80)	S0510870
READ (IFRMT,*) RNPT	S0510880
IF (RNPT .EQ. MINS1) GO TO 1830	S0510890

IF (RNPT .EQ. MINS9) GO TO 20	S0510900
IF (RNPT .GE. 0.0) GO TO 1910	S0510910
GO TO 1890	S0510920
1910 IF(RNPT.GT.0.0) BETA=RNPT	S0510930
1920 WRITE(ICU,9068) IESA,IESJ,ALPHA,BETA	S0510940
C-----ENTER DOWNWIND EXPANSION DISTANCES XRY,XRZ	S0510950
1930 WRITE(ICU,9069) XRY,XRZ,INVNDR,INV,OFF,ULINE,OFF	S0510960
INPT1 = IBLNK	S0510970
READ(IIU,9001) INPT1	S0510980
IF(INPT1 .NE. MINUS1) GOTO 1940	S0510990
WRITE(ICU,9003) IESCAJ,IESCAJ	S0511000
GOTO 1810	S0511010
1940 IF(INPT1 .EQ. MINUS9) GOTO 20	S0511020
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 2040	S0511030
IF (INPT1 .EQ. IYSJ.OR.INPT1.EQ.IYESJ) GO TO 1950	S0511040
WRITE (ICU,9002) INV,OFF,12,6	S0511050
IF (BATCH) GO TO 2420	S0511060
GO TO 1930	S0511070
1950 WRITE(ICU,9070) IESA,IESJ	S0511080
RNPT=0.0	S0511090
CALL IFNBR(IFRMT,14,IER,IIU)	S0511100
IF (IER .EQ. 0) GO TO 1970	S0511110
1960 WRITE (ICU,9002) INV,OFF,12,7	S0511120
IF (BATCH) GO TO 2420	S0511130
GO TO 1950	S0511140
1970 CALL CODE(80)	S0511150
READ (IFRMT,*) RNPT	S0511160
IF (RNPT .EQ. MINS1) GO TO 1980	S0511170
IF (RNPT .EQ. MINS9) GO TO 20	S0511180
IF (RNPT .GE. 0.0) GO TO 1990	S0511190
GO TO 1960	S0511200
1980 WRITE(ICU,9003) IESCAJ	S0511210
GOTO 1930	S0511220
1990 IF(RNPT.GT.0.0) XRY=RNPT	S0511230
2000 WRITE(ICU,9071) IESA,IESJ	S0511240
RNPT=0.0	S0511250
CALL IFNBR(IFRMT,14,IER,IIU)	S0511260
IF (IER .EQ. 0) GO TO 2020	S0511270
2010 WRITE (ICU,9002) INV,OFF,12,8	S0511280
IF (BATCH) GO TO 2420	S0511290
GO TO 2000	S0511300
2020 CALL CODE(80)	S0511310
READ (IFRMT,*) RNPT	S0511320
IF (RNPT .EQ. MINS1) GO TO 1950	S0511330
IF (RNPT .EQ. MINS9) GO TO 20	S0511340
IF (RNPT .GE. 0.0) GO TO 2030	S0511350
GO TO 2010	S0511360
2030 IF(RNPT.GT.0.0) XRZ=RNPT	S0511370
2040 WRITE(ICU,9072) IESA,IESJ,XRY,XRZ	S0511380
IF(.NOT.MODEL4) GOTO 2140	S0511390
C-----ENTER TIMAV	S0511400
2050 WRITE(ICU,9074) INV,TIMAV,OFF,INVNDR,INV,OFF,ULINE,OFF	S0511410

INPT1 = IBLNK	S0511420
READ(IIU,9001) INPT1	S0511430
IF(INPT1 .NE. MINUS1) GOTO 2070	S0511440
2060 WRITE(ICU,9003) IESCAJ,IESCAJ	S0511450
GOTO 1930	S0511460
2070 IF(INPT1 .EQ. MINUS9) GOTO 20	S0511470
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 2130	S0511480
IF (INPT1 .EQ. IYSJ.OR.INPT1 .EQ. IYESJ) GO TO 2080	S0511490
WRITE (ICU,9002) INV,OFF,12,9	S0511500
IF (BATCH) GO TO 2420	S0511510
GO TO 2050	S0511520
2080 WRITE(ICU,9075) IESA,IESJ	S0511530
RNPT=0.0	S0511540
CALL IFNBR(IFRMT,14,IER,IIU)	S0511550
IF (IER .EQ. 0) GO TO 2100	S0511560
2090 WRITE (ICU,9002) INV,OFF,12,10	S0511570
IF (BATCH) GO TO 2420	S0511580
GO TO 2080	S0511590
2100 CALL CODE(80)	S0511600
READ (IFRMT,*) RNPT	S0511610
IF (RNPT .EQ. MINS1) GO TO 2110	S0511620
IF (RNPT .EQ. MINS9) GO TO 20	S0511630
IF (RNPT .GE. 0.0) GO TO 2120	S0511640
GO TO 2090	S0511650
2110 WRITE(ICU,9003) IESCAJ	S0511660
GOTO 2050	S0511670
2120 IF(RNPT.GT.0.0) TIMAV=RNPT	S0511680
2130 WRITE(ICU,9076) IESA,IESJ,TIMAV	S0511690
2140 IF(.NOT.GRVSET) GOTO 2390	S0511700
C-----ENTER GRAVITATIONAL SETTLING DATA.	S0511710
DO 2150 I = 1,NVSDEF	S0511720
VS(I) = VSDEF(I)	S0511730
GAMMAP(I) = GAMDEF(I)	S0511740
FS(I) = FSDEF(I)	S0511750
2150 DBAR(I) = DBRDEF(I)	S0511760
NVS = NVSDEF	S0511770
2160 WRITE(ICU,9009)	S0511780
WRITE(ICU,9077) NVS,VS(1)	S0511790
IF(NVS .GT. 1) WRITE(ICU,9010) (VS(I),I=2,NVS)	S0511800
WRITE(ICU,9081) GAMMAP(1)	S0511810
IF(NVS .GT. 1) WRITE(ICU,9010) (GAMMAP(I),I=2,NVS)	S0511820
WRITE(ICU,9018) FS(1)	S0511830
IF(NVS .GT. 1) WRITE(ICU,9010) (FS(I),I=2,NVS)	S0511840
N = 3	S0511850
IF(.NOT.MODEL6) GOTO 2170	S0511860
N = 4	S0511870
WRITE(ICU,9015) DBAR(1)	S0511880
IF(NVS .GT. 1) WRITE(ICU,9010) (DBAR(I),I=2,NVS)	S0511890
2170 WRITE(ICU,9078) INVNDR,INV,OFF,ULINE,OFF	S0511900
INPT1 = IBLNK	S0511910
READ(ICU,9001) INPT1	S0511920
IF(INPT1 .EQ. MINUS9) GOTO 20	S0511930

NLINES = N + 2	S0511940
IF(NVS .GT. 1) NLINES = NLINES + N	S0511950
IF(NVS .GT. 11) NLINES = NLINES + N	S0511960
IF(INPT1 .NE. MINUS1) GOTO 2180	S0511970
WRITE (ICU,9003) (IESCAJ,I=-1,NLINES)	S0511980
IF(.NOT.MODEL4) GOTO 1930	S0511990
GOTO 2050	S0512000
2180 IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 2380	S0512010
IF (INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 2190	S0512020
WRITE (ICU,9002) INV,OFF,12,11	S0512030
IF (BATCH) GO TO 2420	S0512040
GO TO 2170	S0512050
2190 CONTINUE	S0512060
C ENTER THE NUMBER OF SETTLING CATEGORIES	S0512070
WRITE(ICU,9079) IESA,IESJ,MAXNVS	S0512080
CALL IFNBR(IFRMT,14,IER,IIU)	S0512090
IF (IER .EQ. 0) GO TO 2210	S0512100
2200 WRITE (ICU,9002) INV,OFF,12,12	S0512110
IF (BATCH) GO TO 2420	S0512120
GO TO 2190	S0512130
2210 CALL CODE(80)	S0512140
READ (IFRMT,*) INPT1	S0512150
IF (INPT1 .EQ. MINS1) GO TO 2220	S0512160
IF (INPT1 .EQ. MINS9) GO TO 20	S0512170
IF (INPT1 .GE. 0.AND.INPT1 .LE. MAXNVS) GO TO 2230	S0512180
GO TO 2200	S0512190
2220 NLINES = NLINES + 1	S0512200
GOTO 2370	S0512210
2230 IF (INPT1 .GT. 0) NVS = INPT1	S0512220
NVS = MAX0(1,MINO(NVS,MAXNVS))	S0512230
WRITE(ICU,9080) IESA,IESJ,NVS	S0512240
RNPT = VS(1)	S0512250
READ(IIU,*) (VS(I),I=1,NVS)	S0512260
NLINES = NLINES + 2	S0512270
IF(IFIX(VS(1))+1) 20,2240,2250	S0512280
2240 VS(1) = RNPT	S0512290
GO TO 2370	S0512300
2250 WRITE(ICU,9017) NVS	S0512310
RNPT = GAMMAP(1)	S0512320
READ(IIU,*) (GAMMAP(I),I=1,NVS)	S0512330
NLINES = NLINES + 2	S0512340
IF(IFIX(GAMMAP(1))+1) 20,2260,2270	S0512350
2260 GAMMAP(1) = RNPT	S0512360
GO TO 2370	S0512370
2270 WRITE(ICU,9019) NVS	S0512380
RNPT = FS(1)	S0512390
READ(IIU,*) (FS(I),I=1,NVS)	S0512400
NLINES = NLINES + 2	S0512410
IF(IFIX(FS(1))+1) 20,2280,2290	S0512420
2280 FS(1) = RNPT	S0512430
GO TO 2370	S0512440
2290 IF(.NOT.MODEL6) GOTO 2310	S0512450

WRITE(ICU,9016) NVS	S0512460
RNPT = DBAR(1)	S0512470
READ(IIU,*) (DBAR(I),I=1,NVS)	S0512480
NLINES = NLINES + 2	S0512490
IF(IFIX(DBAR(1))+1) 20,2300,2310	S0512500
2300 DBAR(1) = RNPT	S0512510
GO TO 2370	S0512520
2310 A1 = 0.0	S0512530
DO 2320 I = 1,NVS	S0512540
2320 A1 = A1 + FS(I)	S0512550
IF(ABS(A1-1.0) .LT. 0.01) GOTO 2370	S0512560
DO 2330 I=1,NVS	S0512570
IF (ABS(VS(I)-VSDEF(I)) .GT. 0.001) GO TO 2340	S0512580
IF (ABS(FS(I)-FSDEF(I)) .GT. 0.001) GO TO 2340	S0512590
2330 CONTINUE	S0512600
GO TO 2370	S0512610
2340 A1 = 1.0/A1	S0512620
WRITE(ICU,9020) A1	S0512630
INPT1 = IBLNK	S0512640
READ(ICU,9001) INPT1	S0512650
IF (INPT1 .EQ. MINUS9) GO TO 20	S0512660
IF (INPT1 .EQ. MINUS1) GO TO 2370	S0512670
NLINES = NLINES + 3	S0512680
IF (INPT1 .EQ. IBLNK) GO TO 2370	S0512690
IF (INPT1 .EQ. IHN) GO TO 2350	S0512700
WRITE (ICU,9002) INV,OFF,0,0	S0512710
GO TO 2310	S0512720
2350 DO 2360 I = 1,NVS	S0512730
2360 FS(I) = FS(I)*A1	S0512740
C	S0512750
2370 WRITE (ICU,9003) (IESCAJ,I=1,NLINES)	S0512760
GOTO 2160	S0512770
2380 WRITE(ICU,9003) IESCAJ	S0512780
C	S0512790
2390 CONTINUE	S0512800
GO TO 2430	S0512810
2400 NNNTRY = 5	S0512820
GO TO 2430	S0512830
2410 NNNTRY = 6	S0512840
GO TO 2430	S0512850
2420 NNNTRY = 7	S0512860
2430 NNNEST = 6	S0512870
CALL REEDM	S0512880
END	S0512890

SUBROUTINE ANSW(IDX,IALF,JDX,KDX,IER)	S0600000
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S0600010
INTEGER VARRAY(4,11),INTNMB(4,11)	S0600020
DATA VARRAY/1HO,1HR,1HP,1HD,	S0600030
. 1HS,1HT,2HD2,2HD3,	S0600040
. 1HN,1HS,1HC,2HXX,	S0600050
. 1HH,1HO,1HC,1HA,	S0600060
. 2H39,2H40,2H41,2H17,	S0600070
. 1HS,2HST,1HA,2HXX,	S0600080
. 1HE,1HS,2HXX,2HXX,	S0600090
. 1HU,1HL,2HXX,2HXX,	S0600100
. 1HN,1HY,2HXX,2HXX,	S0600110
. 1HN,1HY,2HXX,2HXX,	S0600120
. 1HC,1HW,1HG,2H-1/	S0600130
DATA INTNMB/2,3,1,4,	S0600140
. 1,2,3,4,	S0600150
. 1,2,3,0,	S0600160
. 1,2,3,4,	S0600170
. 1HS,1HT,1HT,1HD,	S0600180
. 1,2,3,0,	S0600190
. 2,1,0,0,	S0600200
. 1,2,0,0,	S0600210
. 2,1,0,0,	S0600220
. 1,2,0,0,	S0600230
. 1,2,3,0/	S0600240
DATA MINUS9/2H-9/	S0600250
IER = 0	S0600260
DO 10 I=1,4	S0600270
IF(IALF.EQ.VARRAY(I,IDX)) GO TO 40	S0600280
10 CONTINUE	S0600290
IF(IALF.EQ.MINUS9) GO TO 20	S0600300
IER = 1	S0600310
GO TO 30	S0600320
20 JDX=-1	S0600330
GO TO 50	S0600340
30 I=1	S0600350
40 JDX=INTNMB(I,IDX)	S0600360
KDX=KDX*I-KDX+1	S0600370
50 RETURN	S0600380
END	S0600390

REEDM SOURCE MODULE &REDAM

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FTN4
PROGRAM REDAM(5)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700000
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700010
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700020
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700030
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700040
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700050
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700060
C::: ORGANIZATION: H. E. CRAMER CO., INC. :::::::::::::::::::::: S0700070
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700080
C::: WORK FOR: DR. J. B. STEPHENS (ES84) :::::::::::::::::::::: S0700090
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700100
C::: PROGRAM CODE: REEDM :::::::::::::::::::::::::::::::::::::: S0700110
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700120
C::: PROGRAM DESCRIPTION: INPUT USER DATA FOR ROCKET EXHAUST :: S0700130
C::: EFFLUENT DIFFUSION ANALYSIS :::::::::::::::::::::::::::::: S0700140
C::: (MULTI-LAYER) :::::::::::::::::::::::::::::::::::::::::::::: S0700150
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700160
C::: INPUT: USER SPECIFIED OPTIONS :::::::::::::::::::::::::::: S0700170
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700180
C::: OUTPUT: PRINTED AND DISPLAYED LISTING OF USER INPUT VALUES :: S0700190
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700200
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700210
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700220
C S0700230
C C S0700240
C C S0700250
C**** BEGIN COMMON AREA ****S0700260
C 04/02/82 S0700270
C-----MATH PARAMETERS AND CONSTANTS S0700280
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S0700290
C-----INPUT OPTIONS S0700300
REAL LAMBDA S0700310
INTEGER FILE,GOOD,TITLE S0700320
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S0700330
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S0700340
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S0700350
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S0700360
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S0700370
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S0700380
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S0700390
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S0700400
. FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S0700410
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S0700420
. MODEL4,MODEL5,MODEL6 S0700430
INTEGER RUNNUM,RT,CL,CS S0700440
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S0700450
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S0700460
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S0700470
. ,MIXING,MAXDEP,LAYBOT(3) S0700480
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S0700490

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.          ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),      S0700500
.          MINUS1,MINUS9,MIN51,MIN59,                      S0700510
.          MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S0700520
.          RT(24),TPROPC,IDXRT                              S0700530
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S0700540
      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,           S0700550
.          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S0700560
.          CLRLNE,INSLNE,DELNE                              S0700570
      COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S0700580
.          INVNDR(2),ULINE(2),                              S0700590
.          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S0700600
.          CLRLNE,INSLNE,DELNE,                              S0700610
.          IESCAJ(3),NULL,IBLNK,                            S0700620
.          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)         S0700630
C-----VEHICLE PARAMETERS                                  S0700640
      COMMON /VCLPR/ VPAR(17)                               S0700650
C-----TIME PARAMETERS                                    S0700660
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S0700670
.          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)       S0700680
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S0700690
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S0700700
.          RH(30),PTEMP(30),SIGEP(30),SIGAP(30)              S0700710
C-----LAYER PARAMETERS                                   S0700720
      COMMON /LAYER/ DX,DXD,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S0700730
.          SIGYO(29)                                          S0700740
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)         S0700750
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)             S0700760
C-----CALCULATED NEW LAYER PARAMETERS                    S0700770
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S0700780
.          SPEEDN(32)                                         S0700790
C-----CONVERSION FACTORS                                 S0700800
      COMMON /CNVRT/ QCONV(4),QPDEPH                        S0700810
C                                                         S0700820
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION***** S0700830
      COMMON /EXTRA/      NCOM(1),      NTOTAL(1),      PLUS(900) S0700840
C-----READ/WRITE BUFFER                                  S0700850
C-----A R R A Y   = 2077   +   1       +   1       + 2 * 900   = 3879 S0700860
C*****                                                    S0700870
C                                                         S0700880
C-----EQUIVALENCE STATEMENTS                             S0700890
      EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S0700900
.          ,(IPU2,IPAR(4)),(IPU3,IPAR(5))                   S0700910
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)        S0700920
      EQUIVALENCE (INPT(1),PLUS(73))                         S0700930
C                                                         S0700940
C*****          E N D   O F   C O M M O N   A R E A          ***** S0700950
Cc                                                         S0700960
CF-----INPUT FORMAT STATEMENTS                           S0700970
      9001 FORMAT (40A2)                                     S0700980
      9002 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC. S0700990
.          *,I2,IH,,I1/)                                     S0701000
      9003 FORMAT (2A2,A1)                                   S0701010

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CF-----OUTPUT FORMAT STATEMENTS	S0701020
9004 FORMAT(1H1/1X,38(2H**)/1X,8(2H**),44X,8(2H**)/1X,8(2H**),	S0701030
. 25H NASA/MSFC MULTIPLE LAYER	S0701040
., 19H TECHNIQUE - REEDM ,8(2H**)/1X,8(2H**),8H UPDATE,I5,	S0701050
.13H LOCATION ,2A2,14X,8(2H**)/1X,8(2H**),	S0701060
.44X,8(2H**)/1X,38(2H**)/)	S0701070
9005 FORMAT(21X,14A2,7H LAUNCH/)	S0701080
9006 FORMAT(17X,17H LAUNCH TIME: ,I7,2A2,7H DATE: ,I2,1X,2A2,I4)	S0701090
9007 FORMAT(17X,20H TIME OF EXECUTION: ,I4,2A2,7H DATE: ,I2,1X,2A2,I4)	S0701100
9008 FORMAT(/1X,9(2H**),13X,15H MODEL OPTIONS ,12X,9(2H**)/)	S0701110
9009 FORMAT(1X,6H MODEL,46X,12A2)	S0701120
9010 FORMAT(1X,9H RUN TYPE,55X,6A2)	S0701130
9011 FORMAT(1X,15H LAUNCH VEHICLE,47X,7A2)	S0701140
9012 FORMAT(1X,12H LAUNCH TYPE,50X,7A2)	S0701150
9013 FORMAT(1X,22H LAUNCH COMPLEX NUMBER,51X,2A2)	S0701160
9014 FORMAT(1X,8H SPECIES,44X,12A2)	S0701170
9015 FORMAT(1X,12H CLOUD SHAPE,54X,5A2)	S0701180
9016 FORMAT(1X,19H CALCULATION HEIGHT,43X,7A2)	S0701190
9017 FORMAT(1X,28H CALCULATION HEIGHT (METERS),40X,F8.2)	S0701200
9018 FORMAT(1X,32H PROPELLANT TEMPERATURE (DEG. C),38X,F6.2)	S0701210
9019 FORMAT(/1X,9(2H**),11X,19H MODEL PARAMETERS ,10X,9(2H**)/)	S0701220
9020 FORMAT(1X,36H CONCENTRATION AVERAGING TIME (SEC.),34X,F6.2)	S0701230
9021 FORMAT(1X,18H DECAY COEFFICIENT,50X,F8.4)	S0701240
9022 FORMAT(54H ABSORPTION COEFFICIENT (RNG: 0 TO 1,NO ABSORPTION=0),	S0701250
. 15X,F8.4)	S0701260
9023 FORMAT(1X,23H DIFFUSION COEFFICIENTS,34X,11HLATERAL ,F8.4/	S0701270
. 58X,11HVERTICAL ,F8.4)	S0701280
9024 FORMAT(32H VEHICLE ENTRAINMENT PARAMETERS,26X,11HALONGWIND ,F8.4	S0701290
. /58X,11HCROSSWIND ,F8.4/58X,11HVERTICAL ,F8.4)	S0701300
9025 FORMAT(1X,37H DOWNWIND EXPANSION DISTANCE (METERS),20X	S0701310
., 11HLATERAL ,F8.2/58X,11HVERTICAL ,F8.2)	S0701320
9026 FORMAT(1H1/1H1)	S0701330
9027 FORMAT(33H RAINFALL RATE (INCHES PER HOUR),39X,F5.2)	S0701340
9028 FORMAT(33H RAINFALL SCAVENGING COEFFICIENT,32X,1PE12.5)	S0701350
9029 FORMAT(41H TIME RAIN STARTS AFTER LAUNCH (SECONDS),30X,F6.2)	S0701360
9030 FORMAT(23H RAIN DURATION (HOURS),48X,F6.2)	S0701370
9031 FORMAT(23H WASHOUT DEPOSITION IS,40X,14HTIME-DEPENDENT)	S0701380
9032 FORMAT(23H WASHOUT DEPOSITION IS,38X,16HMAXIMUM POSSIBLE)	S0701390
9033 FORMAT(7X,29HNUMBER OF SETTLING CATEGORIES,38X,I3/	S0701400
17X,49HTERMINAL FALL VELOCITY VALUES (METERS PER SECOND),16X,F5.4)	S0701410
9034 FORMAT(7X,54HREFLECTION COEFFICIENT VALUES (RNG: 0 TO 1, NO REF.=0	S0701420
1),11X,F5.4)	S0701430
9035 FORMAT(7X,30HFREQUENCY OF OCCURRENCE VALUES,35X,F5.4)	S0701440
9036 FORMAT(40H GRAVITATIONAL SETTLING CATEGORIES DATA)	S0701450
9037 FORMAT((22X,9(F5.4,1H,),F5.4))	S0701460
9038 FORMAT(30H METEOROLOGICAL DATA SOUNDING,41X,3A2)	S0701470
9039 FORMAT(7X,45HAVERAGE PARTICLE SIZE DIAMETERS (MICROMETERS),	S0701480
1 20X,F5.2)	S0701490
CF-----QUESTION FORMAT STATEMENTS	S0701500
9040 FORMAT(33H PRINT DETAIL MODEL PARAMETERS? (,2A2,1HN,2A2,1HO,2A2,	S0701510
*1H,,2A2,1HY,2A2,5HES):)	S0701520
9041 FORMAT(2A2,19H PRINT OUT WILL BE:,38X,4A2)	S0701530

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9042 FORMAT(1H ,2A2,1HPLEASE WAIT,2A2,26H - TAPE SEARCH IN PROGRESS) S0701540
9043 FORMAT(2A2) S0701550
9044 FORMAT (2A2,53HDO YOU WISH RESULTS FOR ANOTHER CALCULATION HEIGHT? S0701560
* (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S0701570
9045 FORMAT (2A2,53HDO YOU WISH TO PROCESS ANOTHER METEOROLOGICAL CASE? S0701580
* (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S0701590
9046 FORMAT (2A2,30H REEDM HAS TERMINATED NORMALLY) S0701600
9047 FORMAT (2A2,39H NOTE: REEDM HAS TERMINATED ABNORMALLY) S0701610
9048 FORMAT(22H ENTER RAINFALL RATE (,2A2,1HH,2A2,8HEAVY=0.3,2A2,1H,, S0701620
*2A2,1HM,2A2,12HODERATE=0.2,,2A2,1HL,2A2,9HIGHT=0.1,,2A2,1HA,2A2, S0701630
*9HNOTHER):_) S0701640
9049 FORMAT(2A2,40H ENTER RAINFALL RATE (INCHES PER HOUR):_) S0701650
9050 FORMAT(2A2,33H RAINFALL RATE (INCHES PER HOUR):, 24X,F8.2) S0701660
9051 FORMAT(41H RAINFALL SCAVENGING COEFFICIENT (LAMBDA=,2A2,1PE12.5, S0701670
*2A2,10H) CHANGE (,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0701680
9052 FORMAT(2A2,16H ENTER LAMBDA:_) S0701690
9053 FORMAT(2A2,33H RAINFALL SCAVENGING COEFFICIENT:,20X,1PE12.5) S0701700
9054 FORMAT(37H TIME RAIN STARTS AFTER LAUNCH (TIM1=,2A2,F6.2,2A2, S0701710
*18H SECONDS) CHANGE?(,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0701720
9055 FORMAT(2A2,23H ENTER TIM1 (SECONDS):_) S0701730
9056 FORMAT(2A2,41H TIME RAIN STARTS AFTER LAUNCH (SECONDS):,18X,F6.2) S0701740
9057 FORMAT(22H RAIN DURATION (DURAT=,2A2,F6.2,2A2,17H HOURS) CHANGE? (S0701750
*,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0701760
9058 FORMAT(2A2,22H ENTER DURAT (HOURS):_) S0701770
9059 FORMAT(2A2,23H RAIN DURATION (HOURS):,36X,F6.2) S0701780
9060 FORMAT(12H CALCULATE (,2A2,1HM,2A2,15HAXIMUM POSSIBLE,2A2,1H,, S0701790
*2A2,1HT,2A2,36HIME-DEPENDENT) WASHOUT DEPOSITION?:_) S0701800
9061 FORMAT(2A2,23H WASHOUT DEPOSITION IS:,26X,16HMAXIMUM POSSIBLE) S0701810
9062 FORMAT(2A2,23H WASHOUT DEPOSITION IS:,28X,14HTIME-DEPENDENT) S0701820
9063 FORMAT(2A2,61H DO YOU WISH TO CHANGE WASHOUT DEPOSITION CALCULATIO S0701830
*N TYPE? (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S0701840
C-----TYPE AND DIMENSION STATEMENTS S0701850
    INTEGER PO(8) S0701860
    DIMENSION INPT(10),LC(12) S0701870
C S0701880
    EQUIVALENCE (INPT(1),INPT1) S0701890
C-----DATA STATEMENTS S0701900
    DATA LC/2H39,1HA,2H39,1HB,2H39,1HC,2H40,1H ,2H41,1H ,2H17,1H / S0701910
    DATA PO/2H S,2HUM,2HMA,2HRY, S0701920
    . 2HDE,2HTA,2HIL,2HED/ S0701930
    DATA IHT/1HT/,IHA/1HA/, S0701940
    * IHH/1HH/,IHL/1HL/,IHM/1HM/ S0701950
    DATA IIHTI/2HTI/, S0701960
    * IIHAN/2HAN/, S0701970
    * IIHMA/2HMA/,IIHHE/2HHE/,IIHMO/2HMO/, S0701980
    * IIHLI/2HLI/ S0701990
    DATA IESM/15515B/,IESA/15501B/,IESJ/15512B/,IESD/15504B/, S0702000
    * INVBL/62103B/ S0702010
    DATA JVERSN/8213/ S0702020
C S0702030
C S0702040
    IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH) S0702050

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IF (PLUS(745) .NE. -9925.0) GO TO 30	S0702060
C LOCK PRINT OUTPUT UNIT	S0702070
I = 0	S0702080
DO 20 K=2,5	S0702090
IF (IPAR(K) .EQ. ICU.OR.IPAR(K) .LE. 0) GO TO 20	S0702100
J = IFTTY(IPAR(K))	S0702110
IF (J .LT. 0) GO TO 20	S0702120
DO 10 J=2,K	S0702130
IF (IPAR(K) .EQ. IPAR(J-1)) GO TO 20	S0702140
10 CONTINUE	S0702150
I = I+1	S0702160
IFRMT(I) = IPAR(K)	S0702170
20 CONTINUE	S0702180
IF (I .GT. 0) CALL LURQ(1,IFRMT,I)	S0702190
PLUS(745) = 0.0	S0702200
30 IF (CRT) GO TO 40	S0702210
IESM = NULL	S0702220
IESA = NULL	S0702230
IESJ = NULL	S0702240
IESD = NULL	S0702250
INVBL = NULL	S0702260
40 CONTINUE	S0702270
C	S0702280
C-----DETERMINE ENTRY POINT.	S0702290
NNNEST = 2	S0702300
GOTO (50,650,690,810,660,700,800), NNNTRY	S0702310
50 CONTINUE	S0702320
C	S0702330
60 CONTINUE	S0702340
IF(.NOT.MODEL5) GOTO 550	S0702350
C-----ENTER INPUT PARAMETERS FOR MODEL 5 OPTION.	S0702360
C-----ENTER MAXIMUM POSSIBLE WASHOUT DEPOSITION OPTION.	S0702370
IF(.NOT.BATCH) GOTO 70	S0702380
READ(IIU,9001) INPT1	S0702390
GOTO 100	S0702400
70 WRITE(ICU,9060) INVNDR,INV,OFF,ULINE,OFF	S0702410
INPT1 = IBLNK	S0702420
READ(IIU,9001) INPT1	S0702430
IF(INPT1 .NE. MINUS1) GOTO 90	S0702440
IF(IAGAIN .EQ. 1) GOTO 730	S0702450
WRITE(ICU,9003) IESCAJ,IESCAJ	S0702460
IF(IRUN .LT. 3) GOTO 830	S0702470
80 IF(.NOT. GRVSET) GOTO 840	S0702480
N = 4	S0702490
IF(NVS .GT. 1) N = 5	S0702500
IF(NVS .GT. 11) N = 6	S0702510
WRITE (ICU,9003) (IESCAJ,I=1,N)	S0702520
GOTO 850	S0702530
90 IF(INPT1 .EQ. MINUS9) GOTO 860	S0702540
100 IF (INPT1 .EQ. IHT.OR.INPT1 .EQ. IIHTI) GO TO 110	S0702550
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IHM.OR.INPT1.EQ.IIHMA) GO TO 120	S0702560
WRITE (ICU,9002) INV,OFF,13,0	S0702570

IF (BATCH) GO TO 800	S0702580
GO TO 70	S0702590
110 IF(.NOT.BATCH) WRITE (ICU,9062) IESA,IESJ	S0702600
MAXDEP = .FALSE.	S0702610
GOTO 130	S0702620
120 IF(.NOT.BATCH) WRITE (ICU,9061) IESA,IESJ	S0702630
MAXDEP = .TRUE.	S0702640
130 CONTINUE	S0702650
IF(IAGAIN .EQ. 1) GOTO 370	S0702660
C-----ENTER RAINFALL RATE.	S0702670
IF(BATCH) GOTO 150	S0702680
140 WRITE(ICU,9048) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF,ULINE,OFF	S0702690
150 INPT1 = IBLNK	S0702700
CALL IFNBR(INPT,10,IER,IIU)	S0702710
IF(BATCH) GOTO 170	S0702720
IF(INPT1 .NE. MINUS1) GOTO 160	S0702730
WRITE(ICU,9003) IESCAJ,IESCAJ	S0702740
GOTO 70	S0702750
160 IF(INPT1 .EQ. MINUS9) GOTO 860	S0702760
170 IF (INPT1 .EQ. IBLNK.OR.INPT1 .EQ. IIHHE) INPT1 = IHH	S0702770
IF (INPT1 .EQ. IIHMO) INPT1 = IHM	S0702780
IF (INPT1 .EQ. IIHLI) INPT1 = IHL	S0702790
IF (INPT1 .EQ. IIHAN) INPT1 = IHA	S0702800
IF(INPT1 .EQ. IHH) GOTO 260	S0702810
IF(INPT .NE. IHM) GOTO 180	S0702820
RAINRT = 0.2	S0702830
GOTO 260	S0702840
180 IF(INPT .NE. IHL) GOTO 190	S0702850
RAINRT = 0.1	S0702860
GOTO 260	S0702870
190 IF (INPT1 .EQ. IHA) GO TO 210	S0702880
IF (IER .EQ. 0) GO TO 200	S0702890
WRITE (ICU,9002) INV,OFF,14,0	S0702900
IF (BATCH) GO TO 800	S0702910
GO TO 140	S0702920
200 CALL CODE(20)	S0702930
READ(INPT,*) RAINRT	S0702940
IF(RAINRT .LE. 0.0) RAINRT = 0.3	S0702950
IF (.NOT. BATCH) GO TO 270	S0702960
GOTO 280	S0702970
210 WRITE(ICU,9049) IESA,IESJ	S0702980
RNPT = 0.0	S0702990
CALL IFNBR(IFRMT,14,IER,IIU)	S0703000
IF (IER .EQ. 0) GO TO 230	S0703010
220 WRITE (ICU,9002) INV,OFF,14,1	S0703020
IF (BATCH) GO TO 800	S0703030
GO TO 210	S0703040
230 CALL CODE(80)	S0703050
READ (IFRMT,*) RNPT	S0703060
IF (RNPT .EQ. MINS1) GO TO 240	S0703070
IF (RNPT .EQ. MINS9) GO TO 860	S0703080
IF (RNPT .GE. 0.0) GO TO 250	S0703090

GO TO 220	S0703100
240 WRITE(ICU,9003) IESCAJ	S0703110
GOTO 140	S0703120
250 IF(RNPT .GT. 0.0) RAINRT = RNPT	S0703130
260 IF(BATCH) GOTO 280	S0703140
270 WRITE(ICU,9050) IESA,IESJ,RAINRT	S0703150
280 LAMBDA = 5.2E-4*RAINRT*.567	S0703160
IF(IRUN .LT. 3) GOTO 370	S0703170
C-----ENTER RAINFALL SCAVENGING COEFFICIENT.	S0703180
290 WRITE(ICU,9051) INV,LAMBDA,OFF,INVNDR,INV,OFF,ULINE,OFF	S0703190
INPT1 = IBLNK	S0703200
READ(IIU,9001) INPT1	S0703210
IF(INPT1 .NE. MINUS1) GOTO 300	S0703220
WRITE(ICU,9003) IESCAJ,IESCAJ	S0703230
GOTO 140	S0703240
300 IF(INPT1 .EQ. MINUS9) GOTO 860	S0703250
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 360	S0703260
IF (INPT1 .EQ. IYSJ.OR.INPT1 .EQ. IYESJ) GO TO 310	S0703270
WRITE (ICU,9002) INV,OFF,14,2	S0703280
IF (BATCH) GO TO 800	S0703290
GO TO 290	S0703300
310 WRITE(ICU,9052) IESA,IESJ	S0703310
RNPT = 0.0	S0703320
CALL IFNBR(IFRMT,14,IER,IIU)	S0703330
IF (IER .EQ. 0) GO TO 330	S0703340
320 WRITE (ICU,9002) INV,OFF,14,3	S0703350
IF (BATCH) GO TO 800	S0703360
GO TO 310	S0703370
330 CALL CODE(80)	S0703380
READ (IFRMT,*) RNPT	S0703390
IF (RNPT .EQ. MINS1) GO TO 340	S0703400
IF (RNPT .EQ. MINS9) GO TO 860	S0703410
IF (RNPT .GE. 0.0) GO TO 350	S0703420
GO TO 320	S0703430
340 WRITE(ICU,9003) IESCAJ	S0703440
GOTO 290	S0703450
350 IF(RNPT .GT. 0.0) LAMBDA = RNPT	S0703460
360 WRITE(ICU,9053) IESA,IESJ,LAMBDA	S0703470
370 CONTINUE	S0703480
IF(MAXDEP) GOTO 460	S0703490
C-----ENTER TIME RAIN STARTS AFTER LAUNCH.	S0703500
IF(.NOT.BATCH) GOTO 380	S0703510
TIM1 = 0.0	S0703520
READ(IIU,*) TIM1	S0703530
TIM1 = AMAX1(TIM1,0.0)	S0703540
GOTO 460	S0703550
380 WRITE(ICU,9054) INV,TIM1,OFF,INVNDR,INV,OFF,ULINE,OFF	S0703560
INPT1 = IBLNK	S0703570
READ(IIU,9001) INPT1	S0703580
IF(INPT1 .NE. MINUS1) GOTO 390	S0703590
WRITE(ICU,9003) IESCAJ,IESCAJ	S0703600
IF(IAGAIN .EQ. 1) GOTO 70	S0703610

IF(IRUN .LT. 3) GOTO 140	S0703620
GOTO 290	S0703630
390 IF(INPT1 .EQ. MINUS9) GOTO 860	S0703640
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 450	S0703650
IF (INPT1 .EQ. IYSJ.OR.INPT1 .EQ. IYESJ) GO TO 400	S0703660
WRITE (ICU,9002) INV,OFF,15,0	S0703670
IF (BATCH) GO TO 800	S0703680
GO TO 380	S0703690
400 WRITE(ICU,9055) IESA,IESJ	S0703700
RNPT = 0.0	S0703710
CALL IFNBR(IFRMT,14,IER,IIU)	S0703720
IF (IER .EQ. 0) GO TO 420	S0703730
410 WRITE (ICU,9002) INV,OFF,15,1	S0703740
IF (BATCH) GO TO 800	S0703750
GO TO 400	S0703760
420 CALL CODE(80)	S0703770
READ (IFRMT,*) RNPT	S0703780
IF (RNPT .EQ. MINS1) GO TO 430	S0703790
IF (RNPT .EQ. MINS9) GO TO 860	S0703800
IF (RNPT .GE. 0.0) GO TO 440	S0703810
GO TO 410	S0703820
430 WRITE(ICU,9003) IESCAJ	S0703830
IF(IAGIN .EQ. 1) GOTO 70	S0703840
GOTO 380	S0703850
440 IF(RNPT .GT. 0.0) TIM1 = RNPT	S0703860
450 WRITE(ICU,9056) IESA,IESJ,TIM1	S0703870
460 CONTINUE	S0703880
IF(IAGAIN .EQ. 1) GOTO 680	S0703890
C-----ENTER RAIN DURATION, DURAT.	S0703900
IF(.NOT.BATCH) GOTO 470	S0703910
READ(IIU,*) DURAT	S0703920
IF(DURAT .LE. 0.0) DURAT = 1.0	S0703930
GOTO 550	S0703940
470 WRITE(ICU,9057) INV,DURAT,OFF,INVNDR,INV,OFF,ULINE,OFF	S0703950
INPT1 = IBLNK	S0703960
READ(IIU,9001) INPT1	S0703970
IF(INPT1 .NE. MINUS1) GOTO 480	S0703980
WRITE(ICU,9003) IESCAJ,IESCAJ	S0703990
IF(.NOT.MAXDEP) GOTO 380	S0704000
IF(IRUN .LT. 3) GOTO 140	S0704010
GOTO 290	S0704020
480 IF(INPT1 .EQ. MINUS9) GOTO 860	S0704030
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 540	S0704040
IF (INPT1 .EQ. IYSJ.OR.INPT1 .EQ. IYESJ) GO TO 490	S0704050
WRITE (ICU,9002) INV,OFF,16,0	S0704060
IF (BATCH) GO TO 800	S0704070
GO TO 470	S0704080
490 WRITE(ICU,9058) IESA,IESJ	S0704090
RNPT = 0.0	S0704100
CALL IFNBR(IFRMT,14,IER,IIU)	S0704110
IF (IER .EQ. 0) GO TO 510	S0704120
500 WRITE (ICU,9002) INV,OFF,16,1	S0704130

IF (BATCH) GO TO 800	S0704140
GO TO 490	S0704150
510 CALL CODE(80)	S0704160
READ (IFRMT,*) RNPT	S0704170
IF (RNPT .EQ. MINS1) GO TO 520	S0704180
IF (RNPT .EQ. MINS9) GO TO 860	S0704190
IF (RNPT .GE. 0.0) GO TO 530	S0704200
GO TO 500	S0704210
520 WRITE(ICU,9003) IESCAJ	S0704220
GOTO 470	S0704230
530 IF(RNPT .GT. 0.0) DURAT = RNPT	S0704240
540 WRITE(ICU,9059) IESA,IESJ,DURAT	S0704250
550 CONTINUE	S0704260
IF(IRUN .LT. 3) GOTO 590	S0704270
C-----DETAILED OR SUMMARY PRINT OUT?	S0704280
560 WRITE(ICU,9040) INVNDR,INV,OFF,ULINE,OFF	S0704290
INPT1 = IBLNK	S0704300
READ(IIU,9001) INPT1	S0704310
IF(INPT1 .NE. MINUS1) GOTO 570	S0704320
WRITE(ICU,9003) IESCAJ,IESCAJ	S0704330
IF(MODEL5) GOTO 470	S0704340
GOTO 80	S0704350
570 IDXPO=4	S0704360
IF (INPT1 .EQ. MINUS9) GO TO 860	S0704370
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INOJ) INPT1 = INJ	S0704380
IF (INPT1.EQ.IYESJ) INPT1 = IYSJ	S0704390
CALL ANSW(9,INPT,IPRINT,IDXPO,IER)	S0704400
IF (IER .EQ. 0) GO TO 580	S0704410
WRITE (ICU,9002) INV,OFF,16,2	S0704420
IF (BATCH) GO TO 800	S0704430
GO TO 560	S0704440
580 WRITE(ICU,9041) IESA,IESJ,(PO(I),I=IDXPO,IDXPO+3)	S0704450
590 IF(IRUN.EQ.2) IPRINT=2	S0704460
C-----DO LOOP ON THE RUN NUMBER	S0704470
600 CONTINUE	S0704480
C LOCK OUTPUT DEVICE.	S0704490
WRITE(IOU,9004) IVERSN,LOCATN	S0704500
WRITE(IOU,9005) TITLE	S0704510
WRITE(IOU,9006) LTIME,LSDT(1),LSDT(2),LDAY,LMON(1),LMON(2),LYEAR	S0704520
WRITE(IOU,9007) JTIME,LSDT(1),LSDT(2),JDAY,JMON(1),JMON(2),JYEAR	S0704530
WRITE(IOU,9008)	S0704540
WRITE(IOU,9009) MDLNAM	S0704550
WRITE(IOU,9038) FILE	S0704560
WRITE(IOU,9010) (RT(I),I=IDXRT,IDXRT+5)	S0704570
WRITE(IOU,9011) (TITLE(I),I=1,7)	S0704580
WRITE(IOU,9012) (TITLE(I),I=8,14)	S0704590
I = 2*LSITE-1	S0704600
WRITE(IOU,9013) LC(I),LC(I+1)	S0704610
IF(.NOT.MODEL6) WRITE(IOU,9014)((ICHAR(I+12-3*J),I=1,3),J=1,4)	S0704620
WRITE(IOU,9015) (CS(I),I=IDXCS,IDXCS+4)	S0704630
IF(.NOT.MODEL4) GOTO 610	S0704640
IF(ICALC.LT.3) WRITE(IOU,9016) (CL(I),I=IDXCL,IDXCL+6)	S0704650

	IF(ICALC.EQ.3) WRITE(IOU,9017) CALHT	S0704660
610	CONTINUE	S0704670
	WRITE(IOU,9018) TPROPC	S0704680
	IF(.NOT.MODEL5) GOTO 620	S0704690
	IF(.NOT.MAXDEP) WRITE(IOU,9031)	S0704700
	IF(MAXDEP) WRITE(IOU,9032)	S0704710
	WRITE(IOU,9027) RAINRT	S0704720
	IF(.NOT.MAXDEP) WRITE(IOU,9029) TIM1	S0704730
	WRITE(IOU,9030) DURAT	S0704740
620	CONTINUE	S0704750
	IF(IPRINT.EQ.2) GO TO 630	S0704760
	WRITE(IOU,9019)	S0704770
	IF(MODEL4) WRITE(IOU,9020) TIMAV	S0704780
	IF(MODEL4) WRITE(IOU,9021) DECAY	S0704790
	IF(GASSET) WRITE(IOU,9022) GAMMAP(21)	S0704800
	WRITE(IOU,9023) ALPHA,BETA	S0704810
	WRITE(IOU,9024) GAMMAX,GAMMAY,GAMMAZ	S0704820
	WRITE(IOU,9025) XRY,XRZ	S0704830
	IF(MODEL5) WRITE(IOU,9028) LAMBDA	S0704840
	IF(MODEL5 .OR. .NOT.GRVSET) GOTO 630	S0704850
	WRITE(IOU,9036)	S0704860
	WRITE(IOU,9033) NVS,VS(1)	S0704870
	IF(NVS .GT. 1) WRITE(IOU,9037) (VS(I),I=2,NVS)	S0704880
	WRITE(IOU,9034) GAMMAP(1)	S0704890
	IF(NVS .GT. 1) WRITE(IOU,9037) (GAMMAP(I),I=2,NVS)	S0704900
	WRITE(IOU,9035) FS(1)	S0704910
	IF(NVS .GT. 1) WRITE(IOU,9037) (FS(I),I=2,NVS)	S0704920
	IF(.NOT.MODEL6) GOTO 630	S0704930
	WRITE(IOU,9039) DBAR(1)	S0704940
	IF(NVS .GT. 1) WRITE(IOU,9037) (DBAR(I),I=2,NVS)	S0704950
630	CONTINUE	S0704960
C	UNLOCK OUTPUT DEVICE.	S0704970
	IF(BATCH .OR. IPLACE.NE.2) GO TO 640	S0704980
	WRITE(ICU,9042) OFF(1),INVBL,OFF	S0704990
640	CONTINUE	S0705000
C-----	TRANSFER TO PROGRAM RDATM TO READ METEOROLOGICAL DATA	S0705010
	NNNTRY = 1	S0705020
	CALL REEDM	S0705030
C		S0705040
650	CONTINUE	S0705050
	ALTSV=ALT(1)	S0705060
	IF(IFLG.LT.0) GO TO 790	S0705070
C-----	TRANSFER TO THE PROGRAM RCLDM -- THE CLOUD RISE PROGRAM	S0705080
660	IF(IAGAIN.EQ.0) GO TO 670	S0705090
	IAGAIN=0	S0705100
	ALT(1)=ALTSV	S0705110
	ICALC=3	S0705120
670	NNNTRY = 2	S0705130
	CALL REEDM	S0705140
C		S0705150
680	NNNTRY = 6	S0705160
	CALL REEDM	S0705170

C		S0705180
690	RUNNUM = RUNNUM + 1	S0705190
	IF(RUNNUM .LE. NUMRUN) GOTO 600	S0705200
	IF(IRUN .EQ. 1) GOTO 770	S0705210
C-----	-----ANOTHER CALCULATION HEIGHT	S0705220
	IF(.NOT.MODEL4) GOTO 730	S0705230
	IF(BATCH) GOTO 710	S0705240
700	WRITE(ICU,9044) IESA,IESM,INVNDR,INV,OFF,ULINE,OFF	S0705250
710	INPT1 = IBLNK	S0705260
	READ(IIU,9001) INPT1	S0705270
	IF(.NOT.BATCH.AND.(INPT1.EQ.MINUS1.OR.INPT1.EQ.MINUS9)) GOTO 790	S0705280
	IF(INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 730	S0705290
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 720	S0705300
	IF (BATCH) GO TO 730	S0705310
	WRITE (ICU,9002) INV,OFF,24,0	S0705320
	GO TO 700	S0705330
720	IAGAIN=1	S0705340
	KEEP = 1	S0705350
	IF(BATCH) GOTO 870	S0705360
	GO TO 880	S0705370
730	CONTINUE	S0705380
	IF(.NOT.MODEL5) GOTO 770	S0705390
C-----	-----ANOTHER WASHOUT DEPOSITION CALULATION TYPE.	S0705400
	IAGAIN = 0	S0705410
	IF(BATCH) GOTO 750	S0705420
740	WRITE(ICU,9063) IESA,IESJ,INVNDR,INV,OFF,ULINE,OFF	S0705430
750	INPT1 = IBLNK	S0705440
	READ(IIU,9001) INPT1	S0705450
	IF(.NOT.BATCH.AND.(INPT1.EQ.MINUS1.OR.INPT1.EQ.MINUS9)) GOTO 790	S0705460
	IF(INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 770	S0705470
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 760	S0705480
	WRITE (ICU,9002) INV,OFF,25,0	S0705490
	IF (BATCH) GO TO 800	S0705500
	GO TO 740	S0705510
760	IF (.NOT.BATCH) WRITE (ICU,9003) IESCAJ	S0705520
	IAGAIN = 1	S0705530
	IF(BATCH) GOTO 60	S0705540
	WRITE(ICU,9043) IESA,IESD	S0705550
	GOTO 60	S0705560
770	CONTINUE	S0705570
	IF(BATCH) GOTO 780	S0705580
	WRITE(ICU,9045) IESA,IESM,INVNDR,INV,OFF,ULINE,OFF	S0705590
780	INPT1 = IBLNK	S0705600
	READ(IIU,9001) INPT1	S0705610
	IF(.NOT.BATCH.AND.(INPT1.EQ.MINUS1.OR.INPT1.EQ.MINUS9)) GOTO 790	S0705620
	IF(INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 860	S0705630
	GOTO 810	S0705640
C-----	PROGRAM RESTART - REWIND MET TAPE	S0705650
790	IF(IPLACE.EQ.2) CALL EXEC(3,410B)	S0705660
	GO TO 860	S0705670
800	IERROR(1) = MINS1	S0705680
	WRITE (ICU,9047) IESA,IESM	S0705690

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      GOTO 820
C-----PROGRAM TERMINATION.
      810 WRITE (ICU,9046) IESA,IESM
C
      820 CONTINUE
          WRITE(IOU,9026)
          STOP
      830 NNNTRY = 5
          GO TO 890
      840 NNNTRY = 6
          GO TO 890
      850 NNNTRY = 7
          GO TO 890
      860 NNNTRY = 1
          GO TO 890
      870 NNNTRY = 8
          GO TO 890
      880 NNNTRY = 9
      890 NNNEST = 1
          CALL REEDM
          END

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S0705700
S0705710
S0705720
S0705730
S0705740
S0705750
S0705760
S0705770
S0705780
S0705790
S0705800
S0705810
S0705820
S0705830
S0705840
S0705850
S0705860
S0705870
S0705880
S0705890
S0705900

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SUBROUTINE ANSW(IDX,IALF,JDX,KDX,IER)	S0800000
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S0800010
INTEGER VARRAY(4,11),INTNMB(4,11)	S0800020
DATA VARRAY/1HO,1HR,1HP,1HD,	S0800030
. 1HS,1HT,2HD2,2HD3,	S0800040
. 1HN,1HS,1HC,2HXX,	S0800050
. 1HH,1HO,1HC,1HA,	S0800060
. 2H39,2H17,2H40,2H41,	S0800070
. 1HS,2HST,1HA,2HXX,	S0800080
. 1HE,1HS,2HXX,2HXX,	S0800090
. 1HU,1HL,2HXX,2HXX,	S0800100
. 1HN,1HY,2HXX,2HXX,	S0800110
. 1HN,1HY,2HXX,2HXX,	S0800120
. 1HC,1HW,1HG,2H-1/	S0800130
DATA INTNMB/2,3,1,4,	S0800140
. 1,2,3,4,	S0800150
. 1,2,3,0,	S0800160
. 1,2,3,4,	S0800170
. 1HS,1HD,1HT,1HT,	S0800180
. 1,2,3,0,	S0800190
. 2,1,0,0,	S0800200
. 1,2,0,0,	S0800210
. 2,1,0,0,	S0800220
. 1,2,0,0,	S0800230
. 1,2,3,0/	S0800240
DATA MINUS9/2H-9/	S0800250
IER = 0	S0800260
DO 10 I=1,4	S0800270
IF(IALF.EQ.VARRAY(I,IDX)) GO TO 40	S0800280
10 CONTINUE	S0800290
IF(IALF.EQ.MINUS9) GO TO 20	S0800300
IER = 1	S0800310
GO TO 30	S0800320
20 JDX=-1	S0800330
GO TO 50	S0800340
30 I=1	S0800350
40 JDX=INTNMB(I,IDX)	S0800360
KDX=KDX*I-KDX+1	S0800370
50 RETURN	S0800380
END	

REEDMSOURCE MODULE &RDATM

FTN4	S0900000
PROGRAM RDATM(5)	S0900010
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S0900020
C::	S0900030
C::	S0900040
C:::	S0900050
C:::	S0900060
C::: ORGANIZATION: H. E. CRAMER CO., INC.	S0900070
C:::	S0900080
C::: WORK FOR: DR. J. B. STEPHENS (ES84)	S0900090
C:::	S0900100
C::: PROGRAM CODE: RDATM	S0900110
C:::	S0900120
C::: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST	S0900130
C::: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER)	S0900140
C:::	S0900150
C::: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS	S0900160
C:::	S0900170
C::: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS	S0900180
C:::	S0900190
C::	S0900200
C::	S0900210
C	S0900220
C *****	S0900230
C *	S0900240
C * NASA/MSFC MULTILAYER DIFFUSION MODEL -- 30 OCT 1978 *	S0900250
C *	S0900260
C * METEOROLOGICAL INPUT PROGRAM -- RDATM *	S0900270
C *	S0900280
C *****	S0900290
Cc	S0900300
C**** BEGIN COMMON AREA	S0900310
C 04/02/82	S0900320
C-----MATH PARAMETERS AND CONSTANTS	S0900330
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S0900340
C-----INPUT OPTIONS	S0900350
REAL LAMBDA	S0900360
INTEGER FILE,GOOD,TITLE	S0900370
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S0900380
ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S0900390
XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S0900400
IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S0900410
ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S0900420
,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S0900430
,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S0900440
TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S0900450
FS(20),MDLNAM(12),DBAR(20)	S0900460
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S0900470
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S0900480
MODEL4,MODEL5,MODEL6	S0900490

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      INTEGER RUNNUM,RT,CL,CS
      COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
      .             DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
      .             SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP
      .             ,MIXING,MAXDEP,LAYBOT(3)
      .             ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
      .             ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
      .             MINUS1,MINUS9,MINS1,MINS9,
      .             MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
      .             RT(24),TPROPC,IDXRT
      C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
      .       TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
      .       CLRLNE,INSLNE,DELNE
      COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
      .             INVNDR(2),ULINE(2),
      .             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
      .             CLRLNE,INSLNE,DELNE,
      .             IESCAJ(3),NULL,IBLNK,
      .             IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
      C-----VEHICLE PARAMETERS
      COMMON /VCLPR/ VPAR(17)
      C-----TIME PARAMETERS
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
      .             LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)
      C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
      .             RH(30),PTEMP(30),SIGEP(30),SIGAP(30)
      C-----LAYER PARAMETERS
      COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
      .             SIGYO(29)
      C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)
      C-----CALCULATED NEW LAYER PARAMETERS
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
      .             SPEEDN(32)
      C-----CONVERSION FACTORS
      COMMON /CNVRT/ QCONV(4),QPDEPH
      C
      C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
      COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
      C-----READ/WRITE BUFFER
      C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
      C*****
      C
      REAL MAXHGT
      C-----EQUIVALENCE STATEMENTS
      EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))
      .             ,(IPU2,IPAR(4)),(IPU3,IPAR(5))
      EQUIVALENCE(MAXDEP,GRVSET),(IFRMT(1),IFRMT1)
      C
      C****
      END OF COMMON AREA
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S0900500
S0900510
S0900520
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S0900950
S0900960
S0900970
S0900980
S0900990
S0901000
S0901010

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Cc	S0901020
CF-----INPUT FORMAT STATEMENTS	S0901030
9001 FORMAT (I4,3XI2,1XA2,A1,1XI4)	S0901040
9002 FORMAT (F6.0,1XF3.0,1X,F3.0,F6.1,F6.1,F8.2,1XF3.0,7XF7.2)	S0901050
9003 FORMAT (F6.2)	S0901060
9004 FORMAT (I2)	S0901070
9005 FORMAT (A2)	S0901080
CF	S0901090
CF-----OUTPUT FORMAT STATEMENTS	S0901100
9006 FORMAT(1H1,22(1H*),11X,19HMETEOROLOGICAL DATA,10X,22(1H*)//	S0901110
.5X,11HRUN NUMBER:,I4,10X,33H USING METEOROLOGICAL DATA FILE: ,3A2/	S0901120
.)	S0901130
9007 FORMAT(61H ** MAXIMUM DATA FILE NUMBER IS 99 - PROCESSING TERMINATS	S0901140
.ES **,5X,3A2)	S0901150
9008 FORMAT (33H0*** REEDM ERROR 011, OPEN ERROR ,I4,18H ON SOUNDING FIS	S0901160
*LE ,3A2)	S0901170
9009 FORMAT (34H0*** REEDM ERROR 012, READF ERROR ,I4,18H ON SOUNDING FS	S0901180
*ILE ,3A2)	S0901190
9010 FORMAT (6X,40A2)	S0901200
9011 FORMAT (1H1,5X,6HTIME: ,I4,2A2,4X,6HDATE: ,I2,1X,A2,A1,1X,I4)	S0901210
9012 FORMAT(//1X,22(1H*),16X,8HSOUNDING,16X,22(1H*)//)	S0901220
9013 FORMAT(//1X,22(1H*),16X,8HFORECAST,16X,22(1H*)//)	S0901230
9014 FORMAT (28H0SURFACE DENSITY (GM/M**3): ,F8.2)	S0901240
9015 FORMAT (5H0 MET/	S0901250
.48H LEVEL ALTITUDE DIR. SPEED TEMP,	S0901260
. 32H PTEMP DPTMP PRESS RH/	S0901270
. 47H NO. (FT) (M) (DEG) (M/S) (KTS)	S0901280
. 33H (DEG. C) (MB.) (%) /	S0901290
.,44(2H--))	S0901300
9016 FORMAT(2XI2,4XI5,2XF6.1,2XF5.1,2(1XF5.2),3XF5.1,2XF5.2,2XF4.1,	S0901310
.5XF6.1,4XF4.1,4XA2)	S0901320
9017 FORMAT(//20(1H*),8X,22HMETEOROLOGICAL OPTIONS,9X,20(1H*)//	S0901330
.43H BOTTOM OF SURFACE LAYER HEIGHT (METERS):,9X,F8.3/	S0901340
.43H MIXING LAYER HEIGHT (METERS):,9X,F8.3/	S0901350
.42H STND. DEV OF WIND AZIMUTH ANGLE (DEGRS):,10X,F8.5)	S0901360
9018 FORMAT(/1X,73H ** - INDICATES THAT DATA IS LINEARLY INTERPOLATED FS	S0901370
.ROM INPUT METEOROLOGY)	S0901380
9019 FORMAT(67H0*** REEDM ERROR 013, CALCULATION HEIGHT IS ABOVE INPUT	S0901390
*MET. LEVELS)	S0901400
9020 FORMAT(37H0* PROCESSING CONTINUES WITH NEXT RUN/1H1)	S0901410
9021 FORMAT (F6.0,1X,F3.0,1X,F3.0,2F6.1,F7.1,1X,F3.0)	S0901420
9022 FORMAT(66H0*** REEDM ERROR 014, NO VALID SOUNDING LEVELS WERE FOUNS	S0901430
*D ON FILE ,3A2/)	S0901440
9023 FORMAT (49H0*** REEDM WARNING 024, ZERO WIND SPEED AT LEVEL ,I2,	S0901450
*27H, PROG. SUBSTITUTES 1.0 M/S/5X,39HDIRECTION NOT MODIFIED MAY BES	S0901460
* INCORRECT)	S0901470
9024 FORMAT (41H0*** REEDM WARNING 025, EOF READ IN FILE ,3A2,	S0901480
*50H, NNNN SHOULD BE LAST IMAGE, DATA MAY BE TRUNCATED)	S0901490
C	S0901500
C-----TYPE AND DIMENSION STATEMENTS	S0901510
DIMENSION IDCB(272),IBUF(40),DPTMP(30),LEVELS(30),NTEST(5),	S0901520
*ALTS(100),DIRS(100),SPEEDS(100),TEMPS(100),PRESSSS(100),RHS(100),	S0901530

*PTemps(100)	S0901540
C	S0901550
EQUIVALENCE (IFRMT,IBUF),(ALTS(1),PLUS(1)),(DIRS(1),PLUS(101)),	S0901560
*(SPEEDS(1),PLUS(201)),(TEMPs(1),PLUS(301)),(PRESSs(1),PLUS(401)),	S0901570
*(RHS(1),PLUS(501)),(PTemps(1),PLUS(601))	S0901580
C	S0901590
C-----DATA STATEMENTS	S0901600
DATA LEVELS/30*2H /	S0901610
DATA NTEST/2HTE,2HTR,2HMA,2HAL,2HSI/	S0901620
DATA MAXHGT/10000.0/,MAXLVS/100/	S0901630
DATA IIHNN/2HNN/,IIHTE/2HTE/,IIHRA/2HRA/,IIHFO/2HFO/,IIHST/2HST/,	S0901640
*IIH00/2H00/,IIH99/2H99/	S0901650
DATA JVERSN/8213/	S0901660
C	S0901670
C	S0901680
C-----INITIALIZE I/O DEVICES,COMMON VARIABLES,CONSTANTS	S0901690
C!!!! H.E.C ONLY.	S0901700
C ONLY USE IF WANT MATERIAL FROM HIGH ALTITUDES WHEN CALCULATING	S0901710
C DEPOSITION OR CONCENTRATION FROM AL203.	S0901720
C IF (GRVSET .AND. .NOT. MODEL5) MAXHGT = 20000.0	S0901730
C!!!!	S0901740
IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S0901750
IFLG=0	S0901760
ISNDFO = .FALSE.	S0901770
H=0.0	S0901780
C	S0901790
C-----SET UP THE FILE NAME FOR THIS RUN AND WRITE OUT THE HEADER	S0901800
ISETS = 1	S0901810
IWANT = 0	S0901820
IINFN = 0	S0901830
C IF MAG. TAPE (TAPE##)	S0901840
IF (IPLACE .EQ. 2) GO TO 10	S0901850
C DISC FILE	S0901860
IF (IPLACE .EQ. 3) GO TO 20	S0901870
C SPECIAL DISC FILE (DATA##) OR TAPE (TAPE##)	S0901880
10 IASFN = FILE(3)	S0901890
CALL CODE(2)	S0901900
READ (IASFN,9004) IINFN	S0901910
IWANT = IINFN+RUNNUM	S0901920
20 CONTINUE	S0901930
IF (IPLACE .EQ. 3.AND.RUNNUM .GT. 1) IWANT = 0	S0901940
WRITE (IOU,9006) RUNNUM,(FILE(J),J=1,3)	S0901950
C-----IF THE DATA IS ON A DISK FILE, READ FROM DISK -- IF IT	S0901960
C IS ON TAPE, READ IT AS KSC 1965 DATA IN SUBROUTINE KSC65	S0901970
IF(IPLACE .NE. 2)GO TO 30	S0901980
CALL KSC65(IWANT,IEOF)	S0901990
IF(IEOF) 420,240,170	S0902000
C-----OPEN THE DATA FILE FOR THIS RUN	S0902010
30 CALL OPEN(IDCB,IERR,FILE,1B)	S0902020
IF(IERR .GT. 0) GO TO 40	S0902030
WRITE(IOU,9008) IERR,FILE	S0902040
GO TO 420	S0902050

40	CONTINUE	S0902060
C-----	READ THE HEADINGS FROM THE DATA FILE, SETTING UP THE	S0902070
C	APPROPRIATE PARAMETERS	S0902080
	CALL READF(IDCIB,IERR,IBUF,40,LEN)	S0902090
	IF(IERR .GE. 0)GO TO 60	S0902100
50	WRITE (IOU,9009) IERR,FILE	S0902110
	IF (.NOT.BATCH) WRITE (ICU,9009) IERR,FILE	S0902120
	GO TO 420	S0902130
60	IF (IWANT .LE. ISETS) GO TO 70	S0902140
	IF (IBUF(1).NE.IIHNN.OR.IBUF(2).NE.IIHNN) GO TO 40	S0902150
	ISETS = ISETS+1	S0902160
	GO TO 40	S0902170
70	IF (IBUF(1) .NE. IIHTE)GO TO 40	S0902180
80	WRITE (IOU,9010) (IBUF(I),I=1,LEN)	S0902190
90	CALL READF(IDCIB,IERR,IBUF,40,LEN)	S0902200
	IF(IERR .LT. 0)GO TO 50	S0902210
	IF (IBUF(1).NE.IIHRA.AND. IBUF(1).NE.IIHFO)GO TO 90	S0902220
	ISNDFO = .FALSE.	S0902230
	IF (IBUF(1) .EQ. IIHFO) ISNDFO = .TRUE.	S0902240
	WRITE (IOU,9010) (IBUF(I),I=1,LEN)	S0902250
	CALL READF(IDCIB,IERR,IBUF,40,LEN)	S0902260
	IF(IERR .LT. 0)GO TO 50	S0902270
	WRITE (IOU,9010) (IBUF(I),I=1,LEN)	S0902280
C-----	READ THE SOUNDING/FORECAST TIME	S0902290
	CALL READF(IDCIB,IERR,IBUF,9)	S0902300
	IF(IERR .LT. 0)GO TO 50	S0902310
	CALL CODE(80)	S0902320
	READ (IBUF,9001) ISTEIME,ISDAY,ISMON(1),ISMON(2),ISYEAR	S0902330
C	CHANGE TO EST OR EDT DEPENDING ON LAUNCH TIME	S0902340
	ISTEIME = ISTEIME - 500	S0902350
	IF (IPLACE .EQ. 1)ISTEIME = ISTEIME - 300	S0902360
	IF (LSDT(2) .NE. IIHST)ISTEIME = ISTEIME + 100	S0902370
	IF (ISTEIME .GT. 0)GO TO 100	S0902380
	ISTEIME = 2400 + ISTEIME	S0902390
	ISDAY = ISDAY - 1	S0902400
C	WRITE OUT THE NEXT LINE OF THE HEADER	S0902410
100	CALL READF(IDCIB,IERR,IBUF,40,LEN)	S0902420
	IF(IERR .LT. 0)GO TO 50	S0902430
	WRITE (IOU,9010) (IBUF(I),I=1,LEN)	S0902440
C-----	WRITE OUT THE SOUNDING/FORECAST TIME	S0902450
	WRITE (IOU,9011) ISTEIME,LSDT(1),LSDT(2),ISDAY,ISMON(1),ISMON(2),	S0902460
	ISYEAR	S0902470
C-----	FIND THE FIRST DATA POINT WITH AN ALTITUDE OF 10 FEET	S0902480
C	OR ABOVE. TRY TO FIND A TOTAL OF MAXLEV POINTS WITH ALTITUDES	S0902490
C	BETWEEN 10 AND MAXHGT FEET INCLUSIVE	S0902500
	JJ = 0	S0902510
	DO 230 I=1,MAXLVS	S0902520
110	DO 120 K=1,40	S0902530
120	IBUF(K) = IBLNK	S0902540
	CALL READF(IDCIB,IERR,IBUF,40,LEN)	S0902550
	IF (I .GT. 1) GO TO 130	S0902560
	IF (IERR .LT. 0) GO TO 50	S0902570

	GO TO 140	S0902580
130	IF(IERR.LT.0 .AND. IERR.NE.-12) GO TO 50	S0902590
	IF(LEN.NE.-1) GO TO 140	S0902600
	WRITE (IOU,9024) FILE	S0902610
	IF (.NOT.BATCH) WRITE (ICU,9024) FILE	S0902620
	GO TO 240	S0902630
140	DO 150 K=1,LEN	S0902640
	KK = K	S0902650
	IF (IBUF(K) .NE. IBLNK) GO TO 160	S0902660
150	CONTINUE	S0902670
	GO TO 110	S0902680
160	CONTINUE	S0902690
	IF (IBUF(KK) .EQ. IIHNN) GO TO 240	S0902700
	DO 170 K=1,5	S0902710
	IF (IBUF(KK) .NE. NTEST(K)) GO TO 170	S0902720
	IF (K .EQ. 3) JJ = 1	S0902730
	IF (K .EQ. 5) JJ = 2	S0902740
	GO TO 110	S0902750
170	CONTINUE	S0902760
C	CHECK FOR ALPHA OR NUMERIC FIELDS.	S0902770
C	CALL B2Z(IBUF(L),J)	S0902780
	IF(IBUF(KK).LT.IIH00.OR. IBUF(KK).GT.IIH99)GO TO 110	S0902790
C	READ LEVEL DEPENDING ON TYPE.	S0902800
	IF (JJ .EQ. 1) GO TO 180	S0902810
	CALL CODE(80)	S0902820
	READ (IBUF,9002) ALTS(I),DIRS(I),SPEEDS(I),TEMPS(I),PTEMPS(I), PRESSSS(I),RHS(I),DNSTY	S0902830 S0902840
	GO TO 190	S0902850
180	CONTINUE	S0902860
	CALL CODE(80)	S0902870
	READ (IBUF,9021) ALTS(I),DIRS(I),SPEEDS(I),TEMPS(I),PTEMPS(I), PRESSSS(I),RHS(I)	S0902880 S0902890
190	CONTINUE	S0902900
	IF (DIRS(I) .GT. 360.0) GO TO 110	S0902910
	IF (SPEEDS(I) .GE. 99.0) GO TO 110	S0902920
	IF (TEMPS(I) .GE. 99.0) GO TO 110	S0902930
	IF (PTEMPS(I) .GE. 99.0) GO TO 110	S0902940
	IF (PRESSSS(I) .GE. 9999.0) GO TO 110	S0902950
	IF (RHS(I) .GE. 999.0) GO TO 200	S0902960
	IF (JJ .NE. 2) GO TO 210	S0902970
C	CALCULATE RH FOR SIGNIFICANT LEVELS AND MISSING	S0902980
200	CALL RELHH(TEMPS(I),PTEMPS(I),PRESSSS(I),RHS(I))	S0902990
210	CONTINUE	S0903000
	IF(ALTS(I).LT.10.0 .OR. ALTS(I).GT.MAXHGT) GO TO 110	S0903010
	IF(I.EQ.1) SURDEN=DNSTY	S0903020
	IF(I.EQ.1) SAVEH = ALTS(1)	S0903030
	IF(I.GT.1 .AND. ALTS(I).LT.SAVEH.AND.JJ.EQ.0) SURDEN=DNSTY	S0903040
	IF(I.EQ.1) GO TO 230	S0903050
	J1=I-1	S0903060
	DO 220 K=1,J1	S0903070
	IF(ABS(ALTS(I)-ALTS(K))-1.0) 110,110,220	S0903080
220	CONTINUE	S0903090

230	NUM = I	S0903100
	GO TO 240	S0903110
C	SORT ALL THE DATA POINTS SO THEY APPEAR IN ASCENDING	S0903120
C	ORDER OF ALTITUDE	S0903130
240	NUM1 = NUM - 1	S0903140
	IF(NUM1) 250,290,260	S0903150
250	WRITE (IOU,9022) FILE	S0903160
	GOTO 420	S0903170
260	DO 280 I=1,NUM1	S0903180
	JJ = NUM - I	S0903190
	DO 270 J=1,JJ	S0903200
	J1 = J + 1	S0903210
	IF(ALTS(J) .LE. ALTS(J1))GO TO 270	S0903220
	ARG = ALTS(J)	S0903230
	ALTS(J) = ALTS(J1)	S0903240
	ALTS(J1) = ARG	S0903250
	ARG = DIRS(J)	S0903260
	DIRS(J) = DIRS(J1)	S0903270
	DIRS(J1) = ARG	S0903280
	ARG = SPEEDS(J)	S0903290
	SPEEDS(J) = SPEEDS(J1)	S0903300
	SPEEDS(J1) = ARG	S0903310
	ARG = TEMPS(J)	S0903320
	TEMPS(J) = TEMPS(J1)	S0903330
	TEMPS(J1) = ARG	S0903340
	ARG = PTEMPS(J)	S0903350
	PTEMPS(J) = PTEMPS(J1)	S0903360
	PTEMPS(J1) = ARG	S0903370
	ARG = PRESSS(J)	S0903380
	PRESSS(J) = PRESSS(J1)	S0903390
	PRESSS(J1) = ARG	S0903400
	ARG = RHS(J)	S0903410
	RHS(J) = RHS(J1)	S0903420
	RHS(J1) = ARG	S0903430
270	CONTINUE	S0903440
280	CONTINUE	S0903450
C	CALL ROUTINE INTERP TO SCAN SORTED DATA POINTS AND IF THE DIFFERENCE	S0903460
C	IN ALTITUDE BETWEEN ANY TWO POINTS IS % 1000 FT DO A LINEAR INTERPOL-	S0903470
C	ATION TO CREATE INTERMEDIATE LEVELS BETWEEN THE POINTS	S0903480
	CALL INTRP(LEVELS)	S0903490
C-----	ZERO OUT THE REMAINING ELEMENTS OF THE ARRAYS	S0903500
290	CONTINUE	S0903510
	NUM1 =NUM	S0903520
	IF (NUM1 .GT. MAXLEV) NUM1 = MAXLEV	S0903530
	DO 300 I=1,NUM1	S0903540
	ALT(I) = ALTS(I)	S0903550
	DIR(I) = DIRS(I)	S0903560
	SPEED(I) = SPEEDS(I)	S0903570
	TEMP(I) = TEMPS(I)	S0903580
	PRESS(I) = PRESSS(I)	S0903590
	PTEMP(I) = PTEMPS(I)	S0903600
300	RH(I) = RHS(I)	S0903610

IF (NUM1 .GE. MAXLEV) GO TO 320	S0903620
NUM1 = NUM1+1	S0903630
DO 310 I=NUM1,MAXLEV	S0903640
ALT(I) = 0.0	S0903650
DIR(I) = 0.0	S0903660
SPEED(I) = 0.0	S0903670
TEMP(I) = 0.0	S0903680
PRESS(I) = 0.0	S0903690
RH(I) = 0.0	S0903700
310 PTEMP(I) = 0.0	S0903710
GO TO 330	S0903720
320 IF (.NOT. GRVSET.OR.MODEL5) GO TO 330	S0903730
IF (MAXHGT .LT. 20000.0) GO TO 330	S0903740
ALT(NUM1) = ALTS(NUM)	S0903750
DIR(NUM1) = DIRS(NUM)	S0903760
SPEED(NUM1) = SPEEDS(NUM)	S0903770
TEMP(NUM1) = TEMPS(NUM)	S0903780
PRESS(NUM1) = PRESSS(NUM)	S0903790
RH(NUM1) = RHS(NUM)	S0903800
PTEMP(NUM1) = PTEMPS(NUM)	S0903810
330 IF (NUM .GT. MAXLEV) NUM = MAXLEV	S0903820
NLAYS = NUM-1	S0903830
C-----CONVERT TO METRIC UNITS	S0903840
DO 340 I=1,NUM	S0903850
ALT(I) = 0.3048 * ALT(I)	S0903860
TEMP(I) = TEMP(I) + 273.16	S0903870
SPEED(I) = 0.515 * SPEED(I)	S0903880
IF (SPEED(I) .GT. 0.0) GO TO 340	S0903890
WRITE (IOU,9023) I	S0903900
IF (.NOT.BATCH) WRITE (ICU,9023) I	S0903910
SPEED(I) = 1.0	S0903920
340 CONTINUE	S0903930
IF(ICALC.NE.3) GO TO 350	S0903940
IF(CALHT.LE.ALT(NUM)) GO TO 350	S0903950
WRITE(IOU,9019)	S0903960
WRITE(IOU,9020)	S0903970
IF (.NOT.BATCH) WRITE (ICU,9020)	S0903980
GO TO 420	S0903990
C-----SAVE DEW POINT TEMP AND CALCULATE POTENTIAL TEMPERATURE	S0904000
350 DO 360 I=1,NUM	S0904010
DPTEMP(I)=PTEMP(I)	S0904020
PTEMP(I)=0.0	S0904030
PTEMP(I) = POTMP(TEMP(I),RH(I),PRESS(I))	S0904040
360 CONTINUE	S0904050
C-----WRITE THE HEADER FOR SOUNDING OR FORECAST	S0904060
IF(ISNDFO) GO TO 370	S0904070
WRITE (IOU,9012)	S0904080
GO TO 380	S0904090
370 WRITE (IOU,9013)	S0904100
C-----WRITE THE SURFACE DENSITY AND ALL THE DATA POINTS	S0904110
380 WRITE (IOU,9014) SURDEN	S0904120
WRITE (IOU,9015)	S0904130

DO 390 I=1,NUM	S0904140
IALTF = 3.281 * ALT(I) + 0.5	SC904150
ALTM = ALT(I)	S0904160
SPDKNT=SPEED(I)*1.94175	S0904170
APTEMP = PTEMP(I) - 273.16	S0904180
TTEMP = TEMP(I) - 273.16	S0904190
390 WRITE (IOU,9016) I,IALTF,ALTM,DIR(I),SPEED(I),SPDKNT,TTEMP,	S0904200
APTEMP,DPTTEMP(I),PRESS(I),RH(I),LEVELS(I)	S0904210
WRITE(IOU,9018)	S0904220
C-----DEFAULT REFERENCE HEIGHT TO BOTTOM LEVEL	S0904230
ZRK=ALT(1)	S0904240
C-----DETERMINE THE DEFAULT VALUE OF SIGMA[R]	S0904250
J1=1	S0904260
J2=1	S0904270
J3=0	S0904280
DO 400 JJ=1,NUM-1	S0904290
IF(ABS(PRESS(JJ)-1000.).LT.ABS(PRESS(J2)-1000.)) J2=JJ	S0904300
IF(ALT(JJ).LE.304.8.AND.ALT(JJ+1).GT.304.8) J3=JJ	S0904310
400 CONTINUE	S0904320
CALL RSGAZ(J1,J2,J3,SIGMAR)	S0904330
410 CONTINUE	S0904340
GO TO 430	S0904350
C-----ERROR EXIT.	S0904360
420 IFLG=0	S0904370
IERROR(1) = 1	S0904380
WRITE(IOU,9020)	S0904390
C-----CLOSE THE DATA FILE	S0904400
430 CALL CLOSE(IDCIB)	S0904410
NNNEST = 1	S0904420
NNNTRY = 2	S0904430
CALL REEDM	S0904440
END	S0904450

REEDM SOURCE MODULE &RDATN

FTN4	S1000000
SUBROUTINE KSC65(IWANT,IEOF)	S1000010
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S1000020
C-----	S1000030
C -	S1000040
C - THIS SUBROUTINE READS IN DATA FOR THE REED DIFFUSION	S1000050
C - MODEL FROM MAG TAPE IN KSC 1965 FORMAT	S1000060
C -	S1000070
C-----	S1000080
Cc	S1000090
C**** BEGIN COMMON AREA	****S1000100
C 04/02/82	S1000110
C-----MATH PARAMETERS AND CONSTANTS	S1000120
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S1000130
C-----INPUT OPTIONS	S1000140
REAL LAMBDA	S1000150
INTEGER FILE,GOOD,TITLE	S1000160
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S1000170
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S1000180
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S1000190
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S1000200
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S1000210
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S1000220
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S1000230
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S1000240
. FS(20),MDLNAM(12),DBAR(20)	S1000250
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S1000260
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S1000270
. MODEL4,MODEL5,MODEL6	S1000280
INTEGER RUNNUM,RT,CL,CS	S1000290
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S1000300
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S1000310
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S1000320
. ,MIXING,MAXDEP,LAYBOT(3)	S1000330
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S1000340
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S1000350
. MINUS1,MINUS9,MINS1,MINS9,	S1000360
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S1000370
. RT(24),TPROPC,IDXRT	S1000380
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S1000390
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S1000400
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S1000410
. CLRLNE,INSLNE,DELNE	S1000420
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S1000430
. INVNDR(2),ULINE(2),	S1000440
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S1000450
. CLRLNE,INSLNE,DELNE,	S1000460
. IESCAJ(3),NULL,IBLNK,	S1000470
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S1000480
C-----VEHICLE PARAMETERS	S1000490

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COMMON /VCLPR/ VPAR(17) S1000500
C-----TIME PARAMETERS S1000510
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2) S1000520
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S1000530
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
RH(30),PTEMP(30),SIGEP(30),SIGAP(30) S1000540
C-----LAYER PARAMETERS S1000550
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
SIGYO(29) S1000560
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS) S1000570
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6) S1000580
C-----CALCULATED NEW LAYER PARAMETERS S1000590
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
SPEEDN(32) S1000600
C-----CONVERSION FACTORS S1000610
COMMON /CNVRT/ QCONV(4),QPDEPH S1000620
C S1000630
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S1000640
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S1000650
C-----READ/WRITE BUFFER S1000660
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S1000670
C*****S1000680
C S1000690
C-----EQUIVALENCE STATEMENTS S1000700
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S1000710
, (IPU2,IPAR(4)),(IPU3,IPAR(5)) S1000720
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1) S1000730
C S1000740
C**** END OF COMMON AREA ****S1000750
Cc S1000760
CF-----FORMAT STATEMENTS S1000770
9001 FORMAT (40A2) S1000780
9002 FORMAT (I4,3XI2,1XA2,A1,1XI4) S1000790
9003 FORMAT (F7.0,3XF3.0,5XF3.0,2XF5.1,3XF5.1,3XF6.1,2XF3.0,10XF6.1) S1000800
CF-----OUTPUT FORMAT STATEMENT S1000810
9004 FORMAT (1H1,5X,6HTIME: ,I4,1X,A1,A2,4X,6HDATE: ,I2,1X,A2,A1,1X,I4)S1000820
9005 FORMAT(71H0*** REEDM ERROR 015, UNEXPECTED END OF FILE OCCURRED ONS1000830
1 SOUNDING FILE ,3A2) S1000840
9006 FORMAT(41H0*** REEDM ERROR 016, SOUNDING DATA FILE ,3A2,33H HAS LES1000850
1SS THAN FIVE VALID LEVELS.) S1000860
C S1000870
REAL MAXHGT S1000880
C-----DIMENSION STATEMENT S1000890
C S1000900
DIMENSION IBUF(40),ALTS(100),DIRS(100),SPEEDS(100),TEMPS(100), S1000910
*PRESSS(100),RHS(100),PTEMPS(100),NTEST(7) S1000920
C S1000930
EQUIVALENCE (ALTS(1),PLUS(1)),(DIRS(1),PLUS(101)), S1000940
*(SPEEDS(1),PLUS(201)),(TEMPS(1),PLUS(301)),(PRESSS(1),PLUS(401)), S1000950
*(RHS(1),PLUS(501)),(PTEMPS(1),PLUS(601)) S1000960
C S1000970
S1001000
S1001010

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DATA MAXLVS/100/,MAXHGT/10000.0/	S1001020
DATA NTEST/2HTE,2HST,2HCA,2HAL,2HOR,2H00,2H99/	S1001030
C	S1001040
C-----INITIALIZE THE COUNTER FOR THE NUMBER OF SETS OF DATA TO 0	S1001050
C	S1001060
ISETS = 0	S1001070
IF (GRVSET .AND. .NOT. MODEL5) MAXHGT = 20000.0	S1001080
C-----READ DATA FROM TAPE	S1001090
10 READ (8,9001) (IBUF(I),I=1,40)	S1001100
C-----IF AN EOF ON TAPE, SET THE EOF FLAG AND RETURN	S1001110
CALL EXEC(13,8,IEQT5)	S1001120
IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001130
IF(IEOF .EQ. 1) GOTO 160	S1001140
C-----KEEP READING UNTIL THE STANDARD LEVEL DATA IS FOUND	S1001150
IF(IBUF(1).NE.NTEST(1).OR.IBUF(2).NE.NTEST(2)) GO TO 10	S1001160
ISETS = ISETS+1	S1001170
IF (IWANT .GT. ISETS) GO TO 10	S1001180
20 READ (8,9001) (IBUF(I),I=1,40)	S1001190
CALL EXEC(13,8,IEQT5)	S1001200
IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001210
IF(IEOF .EQ. 1) GOTO 160	S1001220
IF(IBUF(1).NE.NTEST(3).OR. IBUF(2).EQ.NTEST(2))GO TO 20	S1001230
C-----READ THE SOUNDING/FORECAST TIME	S1001240
READ (8,9002) ISTEIME,ISDAY,ISMON(1),ISMON(2),ISYEAR	S1001250
CALL EXEC(13,8,IEQT5)	S1001260
IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001270
IF(IEOF .EQ. 1) GOTO 160	S1001280
C-----CHANGE TO EST OR EDT DEPENDING ON LAUNCH TIME	S1001290
ISTEIME = ISTEIME - 500	S1001300
IF(IPLACE .EQ. 1)ISTEIME = ISTEIME - 300	S1001310
IF(LSDT(2) .NE. NTEST(2))ISTEIME = ISTEIME + 100	S1001320
IF(ISTEIME .GT. 0)GO TO 30	S1001330
ISTEIME = 2400 + ISTEIME	S1001340
ISDAY = ISDAY - 1	S1001350
C-----FIND THE KEY WORD ALTITUDE (AL)	S1001360
30 READ (8,9001) (IBUF(I),I=1,40)	S1001370
CALL EXEC(13,8,IEQT5)	S1001380
IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001390
IF(IEOF .EQ. 1) GOTO 160	S1001400
IF(IBUF(2) .EQ. NTEST(2))GO TO 20	S1001410
IF(IBUF(1) .NE. NTEST(4))GO TO 30	S1001420
C-----LIMIT DATA TO 100 POINTS -- READ THE STANDARD LEVEL DATA	S1001430
DO 70 I=1,100	S1001440
40 READ(8,9001) (IBUF(J),J=1,40)	S1001450
CALL EXEC(13,8,IEQT5)	S1001460
IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001470
IF(IEOF .EQ. 1) GOTO 160	S1001480
CALL B2Z(IBUF(1),J)	S1001490
IF (IBUF(10) .EQ. NTEST(5)) GO TO 80	S1001500
IF (J .GE. NTEST(6).AND.J .LE. NTEST(7)) GO TO 50	S1001510
IF (IBUF(1) .EQ. NTEST(1)) GO TO 80	S1001520
GO TO 40	S1001530

50	CALL CODE(80)	S1001540
	READ(IBUF,9003) ALTS(I),DIRS(I),SPEEDS(I),TEMPS(I),PTEMPS(I),	S1001550
	IPRESSS(I),RHS(I),SURDN	S1001560
	IF(DIRS(I) .GT. 360.0) GOTO 40	S1001570
	IF(DIRS(I) .EQ. 360.0) DIRS(I) = 0.0	S1001580
	IF(SPEEDS(I) .GE. 99.0) GOTO 40	S1001590
	IF(TEMPS(I) .GE. 99.0) GOTO 40	S1001600
	IF(PTEMPS(I) .GE. 99.0) GOTO 40	S1001610
	IF(PRESSS(I) .GE. 9999.0) GOTO 40	S1001620
	IF(RHS(I) .LE. 0.0 .OR. RHS(I) .GT. 100.0) CALL RELHH(TEMPS(I),	S1001630
	1 PTEMPS(I),PRESSS(I),RHS(I))	S1001640
	IF(I .EQ. 1)SURDEN = SURDN	S1001650
	IF(I.GT.1.AND.ALTS(I).LT.ALTS(I-1)) SURDEN=SURDN	S1001660
	IF(ALTS(I) .GT. MAXHGT)GO TO 80	S1001670
C	CHECK FOR DUPLICATE LEVELS.	S1001680
	IF(I .EQ. 1) GOTO 70	S1001690
	J = I - 1	S1001700
	DO 60 K = 1,J	S1001710
	IF(ABS(ALTS(I)-ALTS(K))-1.0) 40,40,60	S1001720
60	CONTINUE	S1001730
70	CONTINUE	S1001740
80	NUM = I	S1001750
	IF(NUM .GT. 100)GO TO 140	S1001760
C-----	FIND THE KEY WORD MANDATORY	S1001770
90	IF (IBUF(10) .EQ. NTEST(5)) GO TO 100	S1001780
	READ (8,9001) (IBUF(I),I=1,40)	S1001790
	CALL EXEC(13,8,IEQT5)	S1001800
	IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001810
	IF(IEOF .EQ. 1) GOTO 160	S1001820
	IF(IBUF(1) .EQ. NTEST(1).AND.IBUF(2) .EQ. NTEST(2))GO TO 150	S1001830
	IF(IBUF(10).NE.NTEST(5))GO TO 90	S1001840
C-----	LIMIT DATA TO 100 POINTS -- READ THE MANDATORY LEVEL DATA	S1001850
100	DO 130 I=NUM,100	S1001860
110	READ(8,9001) (IBUF(J),J=1,40)	S1001870
	CALL EXEC(13,8,IEQT5)	S1001880
	IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001890
	IF(IEOF .EQ. 1) GOTO 140	S1001900
	CALL B2Z(IBUF(1),J)	S1001910
	IF (IBUF(1).EQ.NTEST(1).OR.IBUF(2).EQ.NTEST(2)) GO TO 140	S1001920
	IF(J .LT. NTEST(6).OR. J .GT. NTEST(7)) GOTO 110	S1001930
	CALL CODE(80)	S1001940
	READ(IBUF,9003) ALTS(I),DIRS(I),SPEEDS(I),TEMPS(I),PTEMPS(I),	S1001950
	PRESSS(I),RHS(I)	S1001960
	IF(DIRS(I) .GT. 360.0) GOTO 110	S1001970
	IF(TEMPS(I) .GE. 99.0) GOTO 110	S1001980
	IF(PTEMPS(I) .GE. 99.0) GOTO 110	S1001990
	IF(PRESSS(I) .GE. 9999.0) GOTO 110	S1002000
	IF(RHS(I) .LE. 0.0 .OR. RHS(I) .GT. 100.0) CALL RELHH(TEMPS(I),	S1002010
	1 PTEMPS(I),PRESSS(I),RHS(I))	S1002020
	IF(DIRS(I) .EQ. 360.0)DIRS(I) = 0.0	S1002030
	IF(ALTS(I) .GT. MAXHGT)GO TO 140	S1002040
	IF(I .LE. 1) GOTO 130	S1002050

J = I - 1	S1002060
DO 120 K = 1,J	S1002070
IF(ABS(ALTS(I)-ALTS(K))-1.0) 110,110,120	S1002080
120 CONTINUE	S1002090
130 CONTINUE	S1002100
C-----NUM IS THE NUMBER OF DATA POINTS	S1002110
140 NUM = I - 1	S1002120
C-----INCREMENT THE COUNTER -- IF THIS IS THE SET OF DATA DESIRED,	S1002130
C-----WRITE OUT THE SOUNDING/FORECAST TIME -- OTHERWISE GET THE NEXT	S1002140
C-----SET	S1002150
150 IF (IBUF(1).EQ.NTEST(1).OR.IBUF(2).EQ.NTEST(2)) CALL EXEC(3,210B)	S1002160
C-----WRITE OUT THE SOUNDING/FORECAST TIME	S1002170
WRITE (IOU,9004) ISTIME,LSDT(1),LSDT(2),ISDAY,ISMON(1),ISMON(2),	S1002180
ISYEAR	S1002190
C-----THERE MUST BE 5 OR MORE DATA POINTS FOR THIS TO BE A VALID SET	S1002200
C-----OF DATA -- IF THERE IS NOT, RETURN WITH IEOF = -2.	S1002210
IF(NUM .GT. 4) GOTO 170	S1002220
IEOF = -2	S1002230
WRITE(IOU,9006) FILE	S1002240
GOTO 170	S1002250
160 IEOF = -1	S1002260
WRITE(IOU,9005) FILE	S1002270
170 RETURN	S1002280
C-----END OF KSC65	S1002290
END	S1002300

	SUBROUTINE RELHH(T,DP,P,RH)	S1100000
	. , UPDATE: 8213 SOURCE: 17 FEB 81 LOCATION: KSC	S1100010
C	CALCULATE RELATIVE HUMIDITY	S1100020
	F(A) = 1013.25*EXP(A*(13.3185+A*(-1.976+A*(-.6445-.1299*A))))	S1100030
	Y = 373.16	S1100040
	IF (P .GT. 0.0) Y = (2326.853102-55.974*ALOGT(P))/(9.238574104-	S1100050
	1.15*ALOGT(P))	S1100060
	X = 1.0-Y/(T+273.16)	S1100070
	Y = 1.0-Y/(DP+273.16)	S1100080
	X = F(X)	S1100090
	Y = F(Y)	S1100100
	RH = 100.0*Y/X	S1100110
	IF (RH .GT. 100.0) RH = 100.0	S1100120
	RETURN	S1100130
	END	S1100140

	SUBROUTINE B2Z(IA,IB)	S1200000
	. , UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC	S1200010
C		S1200020
C	-----	S1200030
C	-	S1200040
C	- THIS SUBROUTINE CHANGES BLANK FILLED WORDS TO ZEROS. -	S1200050
C	-	S1200060
C	-----	S1200070
	IB = IAND(IA,177400B)	S1200080
	IF(IB .EQ. 020000B)IB = 030000B	S1200090
	IC = IAND(IA,000377B)	S1200100
	IF(IC .EQ. 000040B)IC = 000060B	S1200110
	IB = IOR(IB,IC)	S1200120
	RETURN	S1200130
	END	S1200140

	FUNCTION POTMP(TMP,RHM,PRSS)	S1300000
	. , UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC	S1300010
C		S1300020
C	-----	S1300030
C	-	S1300040
C	- THIS FUNCTION COMPUTES THE POTENTIAL TEMPERATURE GIVEN	S1300050
C	- AMBIENT AIR TEMPERATURE, RELATIVE HUMIDITY, AND THE	S1300060
C	- ATMOSPHERIC PRESSURE	S1300070
C	-	S1300080
C	-----	S1300090
C		S1300100
	PT = 1.0-373.16/TMP	S1300110
	PT = 1013.25*EXP(PT*(13.3185+PT*(-1.976+PT*(-.6445-.1299*PT))))	S1300120
	PT = RHM*.01*PT	S1300130
	PT = 0.622*PT/(PRSS-PT)	S1300140
	PT = TMP*(1.0+1.61*PT)/(1.0+PT)	S1300150
	POTMP = PT*(1000.0/PRSS)**0.288	S1300160
	RETURN	S1300170
	END	S1300180

	INTEGER FUNCTION ISHIF(IWRD,IPOS)	S1400000
	. , UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC	S1400010
C		S1400020
C	-----	S1400030
C	-	S1400040
C	- THIS FUNCTION SHIFTS BITS IN WORD IWRD BY THE NUMBER OF	S1400050
C	- POSTIONS IN THE VARIABLE IPOS. IF IPOS % 0 BITS ARE	S1400060
C	- SHIFTED TO THE LEFT AND IF IPOS \$ 0 BITS ARE SHIFTED TO	S1400070
C	- THE RIGHT. BITS SHIFTED OFF EITHER END ARE LOST. ALSO	S1400080
C	- THE SIGN OF IWRD IS NOT CHANGED. (LEFTMOST BIT = 16)	S1400090
C	-	S1400100
C	-----	S1400110
C		S1400120
	NPOS=IABS(IPOS)	S1400130
	DO 10 I=1,NPOS	S1400140
	IF(IPOS.LT.0) IWRD=IWRD/2	S1400150
10	IF(IPOS.GT.0) IWRD=IWRD*2	S1400160
	ISHIF=IWRD	S1400170
	RETURN	S1400180
	END	S1400190

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SUBROUTINE INTRP(LEVELS)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C -----S1500000
C -S1500010
C -S1500020
C -S1500030
C - THIS ROUTINE CREATES INTERMEDIATE LEVELS OF MET DATA BETWEEN -S1500040
C - EXISTING LEVELS OF SPARSE DATA USING SIMPLE LINEAR INTERPOLATION -S1500050
C -S1500060
C -----S1500070
C S1500080
C S1500090
C C
C****          B E G I N C O M M O N A R E A          ****S1500100
C 04/02/82S1500110
C-----MATH PARAMETERS AND CONSTANTS S1500120
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S1500130
C-----INPUT OPTIONS S1500140
REAL LAMBDA S1500150
INTEGER FILE,GOOD,TITLE S1500160
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S1500170
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S1500180
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S1500190
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S1500200
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S1500210
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S1500220
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S1500230
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S1500240
. FS(20),MDLNAM(12),DBAR(20) S1500250
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S1500260
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S1500270
. MODEL4,MODEL5,MODEL6 S1500280
INTEGER RUNNUM,RT,CL,CS S1500290
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S1500300
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S1500310
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S1500320
. ,MIXING,MAXDEP,LAYBOT(3) S1500330
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S1500340
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S1500350
. MINUS1,MINUS9,MIN51,MIN59, S1500360
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S1500370
. RT(24),TPROPC,IDXRT S1500380
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S1500390
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S1500400
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S1500410
. CLRLNE,INSLNE,DELNE S1500420
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S1500430
. INVNDR(2),ULINE(2), S1500440
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S1500450
. CLRLNE,INSLNE,DELNE, S1500460
. IESCAJ(3),NULL,IBLNK, S1500470
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S1500480
C-----VEHICLE PARAMETERS S1500490
COMMON /VCLPR/ VPAR(17) S1500500

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C-----TIME PARAMETERS	S1500510
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	S1500520
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	S1500530
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)	S1500540
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),	S1500550
RH(30),PTEMP(30),SIGEP(30),SIGAP(30)	S1500560
C-----LAYER PARAMETERS	S1500570
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),	S1500580
SIGYO(29)	S1500590
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)	S1500600
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)	S1500610
C-----CALCULATED NEW LAYER PARAMETERS	S1500620
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),	S1500630
SPEEDN(32)	S1500640
C-----CONVERSION FACTORS	S1500650
COMMON /CNVRT/ QCONV(4),QPDEPH	S1500660
C	S1500670
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****	S1500680
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)	S1500690
C-----READ/WRITE BUFFER	S1500700
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879	S1500710
C*****	S1500720
C	S1500730
C-----EQUIVALENCE STATEMENTS	S1500740
EQUIVALENCE (IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))	S1500750
, (IPU2,IPAR(4)),(IPU3,IPAR(5))	S1500760
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)	S1500770
C	S1500780
C****	****S1500790
END OF COMMON AREA	S1500800
Cc	S1500810
DIMENSION LEVELS(1),ALTS(100),DIRS(100),SPEEDS(100),TEMPS(100),	S1500820
*PRESSS(100),RHS(100),PTEMPS(100)	S1500830
C	S1500840
EQUIVALENCE (ALTS(1),PLUS(1)),(DIRS(1),PLUS(101)),	S1500850
*(SPEEDS(1),PLUS(201)),(TEMPS(1),PLUS(301)),(PRESSS(1),PLUS(401)),	S1500860
*(RHS(1),PLUS(501)),(PTEMPS(1),PLUS(601))	S1500870
C	S1500880
DATA MAXLVS/100/	S1500890
DATA IIHAT/2H**/	S1500900
C	S1500910
DMAX = 1000.0	S1500920
NLAYS=NUM-1	S1500930
I = 0	S1500940
10 I = I+1	S1500950
IF (I .GT. NLAYS) GO TO 50	S1500960
IP1=I+1	S1500970
DIFF = ALTS(IP1)-ALTS(I)	S1500980
IF(DIFF.LT.DMAX) GO TO 10	S1500990
NWLEVS = INT(DIFF/DMAX)	S1501000
NWLAYS = NWLEVS+1	S1501010
DO 30 J = MAXLVS,IP1,-1	S1501020
K=J+NWLEVS	

IF(K.LE.MAXLVS) GO TO 20	S1501030
GO TO 30	S1501040
20 ALTS(K) = ALTS(J)	S1501050
DIRS(K) = DIRS(J)	S1501060
SPEEDS(K) = SPEEDS(J)	S1501070
TEMPS(K) = TEMPS(J)	S1501080
PRESSS(K) = PRESSS(J)	S1501090
RHS(K) = RHS(J)	S1501100
PTEMPS(K) = PTEMPS(J)	S1501110
30 CONTINUE	S1501120
ALTINC=(ALTS(IP1)-ALTS(I))/NWLAYS	S1501130
SPDINC=(SPEEDS(IP1)-SPEEDS(I))/NWLAYS	S1501140
TMPINC=(TEMPS(IP1)-TEMPS(I))/NWLAYS	S1501150
PRSINC=(PRESSS(IP1)-PRESSS(I))/NWLAYS	S1501160
RHINC=(RHS(IP1)-RHS(I))/NWLAYS	S1501170
PTPINC=(PTEMPS(IP1)-PTEMPS(I))/NWLAYS	S1501180
A1=DIRS(I)	S1501190
A2=DIRS(IP1)	S1501200
ANGMIN=MIN1(A1,A2)	S1501210
ANGMAX=MAX1(A1,A2)	S1501220
AINC=360.0-ANGMAX+ANGMIN	S1501230
IF(AINC.LE.180.0.AND.A1.GT.A2) DRINC=AINC	S1501240
IF(AINC.LE.180.0.AND.A1.LE.A2) DRINC=-AINC	S1501250
IF(AINC.GT.180.0.AND.A1.GT.A2) DRINC=AINC-360.0	S1501260
IF(AINC.GT.180.0.AND.A1.LE.A2) DRINC=360.0-AINC	S1501270
DRINC=DRINC/NWLAYS	S1501280
K=I+NWLEVS	S1501290
DO 40 J = IP1,K	S1501300
JM1=J-1	S1501310
ALTS(J) = ALTS(JM1)+ALTINC	S1501320
SPEEDS(J) = SPEEDS(JM1)+SPDINC	S1501330
TEMPS(J) = TEMPS(JM1)+TMPINC	S1501340
PRESSS(J) = PRESSS(JM1)+PRSINC	S1501350
RHS(J) = RHS(JM1)+RHINC	S1501360
PTEMPS(J) = PTEMPS(JM1)+PTPINC	S1501370
DIRS(J) = DIRS(JM1)+DRINC	S1501380
IF(DIRS(J).GT.360.0) DIRS(J)=DIRS(J)-360.0	S1501390
IF(DIRS(J).LT.0.0) DIRS(J)=360.0+DIRS(J)	S1501400
LEVELS(J)=IIHAT	S1501410
40 CONTINUE	S1501420
NLAYS = NLAYS+NWLEVS	S1501430
IF (NLAYS .GT. MAXLVS-1) NLAYS = MAXLVS-1	S1501440
I = I+NLAYS	S1501450
GO TO 10	S1501460
50 CONTINUE	S1501470
NUM=NLAYS+1	S1501480
IF (NUM .GT. MAXLVS) NUM = MAXLVS	S1501490
RETURN	S1501500
END	S1501510

SUBROUTINE RSGAZ(J1,J2,J3,RSIG)	S1600000
., UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S1600010
C	S1600020
C-----	S1600030
C-	S1600040
C- THIS SUBROUTINE CALCULATES A SIGMA VALUE GIVEN	S1600050
C- ALTITUDE, SPEED, TEMP, AND PRESSURE FOR THE	S1600060
C- FIRST LEVEL OF DATA, THE 1000FT LEVEL OF DATA	S1600070
C- AND THE 1000MB LEVEL OF DATA	S1600080
C- IF THESE LEVELS DON'T EXIST DATA IS LINEARLY INTERPOLATED	S1600090
C- TO THESE LEVELS FOR THE CALCULATION OF SIGMA(A)	S1600100
C-	S1600110
C-----	S1600120
C	S1600130
Cc	S1600140
C****	*****S1600150
B E G I N C O M M O N A R E A	
C 04/02/82	S1600160
C-----MATH PARAMETERS AND CONSTANTS	S1600170
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S1600180
C-----INPUT OPTIONS	S1600190
REAL LAMBDA	S1600200
INTEGER FILE,GOOD,TITLE	S1600210
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S1600220
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S1600230
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S1600240
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S1600250
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S1600260
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S1600270
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S1600280
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S1600290
. FS(20),MDLNAM(12),DBAR(20)	S1600300
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S1600310
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S1600320
. MODEL4,MODEL5,MODEL6	S1600330
INTEGER RUNNUM,RT,CL,CS	S1600340
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S1600350
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S1600360
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S1600370
. ,MIXING,MAXDEP,LAYBOT(3)	S1600380
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S1600390
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S1600400
. MINUS1,MINUS9,MINS1,MINS9,	S1600410
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S1600420
. RT(24),TPROPC,IDXRT	S1600430
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S1600440
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S1600450
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S1600460
. CLRLNE,INSLNE,DELNE	S1600470
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S1600480
. INVNDR(2),ULINE(2),	S1600490
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S1600500

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.          CLRLNE,INSINE,DELIN,          S1600510
.          IESCAJ(3),NULL,IBLNK,        S1600520
.          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S1600530
C-----VEHICLE PARAMETERS          S1600540
COMMON /VCLPR/ VPAR(17)          S1600550
C-----TIME PARAMETERS          S1600560
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
.          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2) S1600570
.          S1600580
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S1600590
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
.          RH(30),PTEMP(30),SIGEP(30),SIGAP(30) S1600600
.          S1600610
C-----LAYER PARAMETERS          S1600620
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
.          SIGYO(29) S1600630
.          S1600640
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS) S1600650
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6) S1600660
C-----CALCULATED NEW LAYER PARAMETERS S1600670
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
.          SPEEDN(32) S1600680
.          S1600690
C-----CONVERSION FACTORS          S1600700
COMMON /CNVRT/ QCONV(4),QPDEPH S1600710
C          S1600720
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S1600730
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S1600740
C-----READ/WRITE BUFFER          S1600750
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S1600760
C*****S1600770
C          S1600780
C-----EQUIVALENCE STATEMENTS          S1600790
EQUIVALENCE (IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S1600800
.          ,(IPU2,IPAR(4)),(IPU3,IPAR(5)) S1600810
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1) S1600820
C          S1600830
C****          E N D   O F   C O M M O N   A R E A          ****S1600840
Cq          S1600850
DATA C1,C2,C3,C4,C5,C6/-0.008,-.00175,.0008,.50864522,.1132, S1600860
.          3.8163/ S1600870
DATA C7/.029/ S1600880
C CALCULATION OF SIGAZ          S1600890
C NEWTONS METHOD FOR SOLUTION OF F(X,B,D) = 0 S1600900
F(X,B,D) =(1.-X**4)/(16.*X*X*(D+C4-2.*ALOG(1.+X)) S1600910
1 - ALOG(1.+X*X)+2.*ATAN(X)**2) - B S1600920
FP(X,D) =(-X**4-1.)/(8.*X**3*(D+C4-2.*ALOG(1.+X)) S1600930
1 - ALOG(1.+X*X)+2.*ATAN(X)**2) + (1.-X**4)/(2.*(1.+X) S1600940
1 *(1.+X*X)*(D+C4-2.*ALOG(1.+X)-ALOG(1.+X*X)+ S1600950
1 2.*ATAN(X)**3) S1600960
C          S1600970
C          S1600980
C          S1600990
RSIG = 0.0 S1601000
C*** READ 1ST DATA LEVEL S1601010
Z1 = ALT(J1) S1601020

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V1 = SPEED(J1)	S1601030
T1 = TEMP(J1)	S1601040
PZ1 = PRESS(J1)	S1601050
C*** READ 1000MB DATA LEVEL	S1601060
FAC=(1000.0-PRESS(J2))/(PRESS(J2+1)-PRESS(J2))	S1601070
Z2 = ALT(J2)+(FAC*(ALT(J2+1)-ALT(J2)))	S1601080
V2 = SPEED(J2)+(FAC*(SPEED(J2+1)-SPEED(J2)))	S1601090
T2 = TEMP(J2)+(FAC*(TEMP(J2+1)-TEMP(J2)))	S1601100
PZ2 = PRESS(J2)+(FAC*(PRESS(J2+1)-PRESS(J2)))	S1601110
C*** READ 1000FT DATA LEVEL	S1601120
FAC=(304.8-ALT(J3))/(ALT(J3+1)-ALT(J3))	S1601130
Z3 = ALT(J3)+(FAC*(ALT(J3+1)-ALT(J3)))	S1601140
V3 = SPEED(J3)+(FAC*(SPEED(J3+1)-SPEED(J3)))	S1601150
T3 = TEMP(J3)+(FAC*(TEMP(J3+1)-TEMP(J3)))	S1601160
PZ3 = PRESS(J3)+(FAC*(PRESS(J3+1)-PRESS(J3)))	S1601170
IF(IRUN.EQ.4) WRITE(10U,9001) Z1,V1,T1,PZ1,Z2,V2,T2,PZ2,Z3,V3,T3	S1601180
.,PZ3	S1601190
9001 FORMAT(12H DIAGNOSTICS/23H SURFACE LEVEL Z,V,T,P=,4F12.5/	S1601200
23H 1000 MB LEVEL Z,V,T,P=,4F12.5/	S1601210
23H 1000 FT LEVEL Z,V,T,P=,4F12.5)	S1601220
C ** CONVERT TO PROPER UNITS	S1601230
C V1 = V1*.514791	S1601240
C V2 = V2*.514791	S1601250
C V3 = V3*.514791	S1601260
C Z1 = Z1*.3048	S1601270
C Z2 = Z2*.3048	S1601280
C Z3 = Z3*.3048	S1601290
C T1 = T1+273.16	S1601300
C T2 = T2+273.16	S1601310
C T3 = T3+273.16	S1601320
C*** INITIALIZE Z0	S1601330
Z0 = .20	S1601340
C PZ1 AND PZ3 IN MILLIBARS	S1601350
C V1,V2 AND V3 IN METER/SEC	S1601360
C Z1,Z2 AND Z3 IN METERS	S1601370
C T1,T2 AND T3 IN DEG K	S1601380
C Z0 IN METERS	S1601390
E = 22.9183118	S1601400
V=V2	S1601410
T=(T1+T2+T3)/3.	S1601420
Z=(Z1*Z2*Z3)**.33333	S1601430
THETA1 = T1*((1000./PZ1)**.288)	S1601440
THETA2 = T2	S1601450
THETA3 = T3*((1000./PZ3)**.288)	S1601460
ZA = (Z1+Z2+Z3)/3.	S1601470
THETA4 = (THETA1 + THETA2 + THETA3)/3.	S1601480
D = Z/Z0	S1601490
ZOZO = ALOG(D)	S1601500
DZTHET = ((Z1-ZA)*(THETA1-THETA4)+(Z2-ZA)*(THETA2-THETA4)	S1601510
1 + (Z3-ZA)*(THETA3-THETA4))/((Z1-ZA)**2 + (Z2-ZA)**2	S1601520
1 + (Z3-ZA)**2)	S1601530
B = 9.8*DZTHET*Z**2/(T*V**2)	S1601540

IF(B) 10,120,40	S1601550
10 CONTINUE	S1601560
R = 1.5	S1601570
U = F(R,B,ZOZO)	S1601580
DO 30 I = 1,50	S1601590
R1 = R - F(R,B,ZOZO)/FP(R,ZOZO)	S1601600
IF(R1 .LE. -1.0) GOTO 220	S1601610
U=F(R1,B,ZOZO)	S1601620
IF(ABS(R1-R).LT.1.E-7) GO TO 80	S1601630
IF(I.EQ.49) USAV = U	S1601640
IF(I.NE.50) GO TO 20	S1601650
IF(USAV.LT.0..AND.U.GT.0..OR.USAV.GT.0..AND.U.LT.0.) GO TO 80	S1601660
20 CONTINUE	S1601670
30 R = R1	S1601680
RSIG = 30.	S1601690
GO TO 220	S1601700
40 AP = ZOZO - 1.	S1601710
ZOOL10=(C6*ZO)/(7.*Z)	S1601720
A1 = 7.*SQRT(B)*AP	S1601730
A2 = 1.	S1601740
A3 = -SQRT(B)*(AP-1.)	S1601750
RAD = A2**2 - 4.*A1*A3	S1601760
IF(RAD) 50,60,70	S1601770
50 CONTINUE	S1601780
RSIG = 30.	S1601790
GO TO 220	S1601800
60 RE11 = -A2/(2.*A1)	S1601810
S1 = 1. - 7.*RE11**2	S1601820
GO TO 130	S1601830
70 RE1 = (-A2 + SQRT(RAD))/(2.*A1)	S1601840
RI4 = RE1**2	S1601850
ZOOL4 = ZO*RI4/(Z*(1. -7.*RI4))	S1601860
IF(B.LT.C3) GO TO 170	S1601870
IF(B.GE.C3) GO TO 190	S1601880
80 RI1 = (1.-RI**4)/16.	S1601890
ZOOL1 = ZO*RI1/Z	S1601900
A = ZOZO +C4-2.*ALOG(1.+RI)-ALOG(1.+RI**2)+2.*ATAN(R1)	S1601910
IF(B.LT.C1) GO TO 90	S1601920
IF(B.GE.C1.AND.B.LT.C2) GO TO 100	S1601930
IF(B.GE.C2) GO TO 110	S1601940
90 RSIG = E*2.7/A	S1601950
GO TO 220	S1601960
100 FB2 = 2.7 + 112.*(-C1 + B)	S1601970
RSIG = E*FB2/A	S1601980
GO TO 220	S1601990
110 FB3 = 3.4 - 725.5*(-C2 +B)	S1602000
RSIG = E*FB3/A	S1602010
GO TO 220	S1602020
120 RI2 = 0	S1602030
ZOOL2 = 0	S1602040
RSIG = 48.816/ZOZO	S1602050
GO TO 220	S1602060

130	RI3 = (S1-1.)/(-7.)	S1602070
	ZOOL3 = Z0*RI3/(Z*(1. -7.*RI3))	S1602080
	IF(B.LT.C3) GO TO 140	S1602090
	IF(B.GE.C3) GO TO 160	S1602100
140	FB3 = 3.4 - 725.5*(-C2 + B)	S1602110
	RSIG = (E*FB3)/(7.*RI3/(1. -7.*RI3) + ZOZO)	S1602120
	SIGR20=(E*FB3)/(C6+ZOZO)	S1602130
	IF(RI3.GE.C5) GO TO 150	S1602140
	GO TO 220	S1602150
150	CONTINUE	S1602160
	RSIG = SIGR20	S1602170
	GO TO 220	S1602180
160	FB4 = 1.55 + 38.04*(B - .0008)	S1602190
	FB5 = 2.35 + 38.04*(B - .0008)	S1602200
	RSIG = (E*FB4)/(ZOZO -7.*RI3/(1. -7.*RI3))	S1602210
	IF(B.GE.C7)RSIG = (E*FB5)/(ZOZO - 7.*RI3/(1. - 7.*RI3))	S1602220
	SIGR21 = (E*FB4)/(C6+ZOZO)	S1602230
	SIGR22 = (E*FB5)/(C6+ZOZO)	S1602240
	IF(RI3.GE.C5.AND.B.LT.C7)RSIG=SIGR21	S1602250
	IF(RI3.GE.C5.AND.B.GE.C7)RSIG=SIGR22	S1602260
	GO TO 220	S1602270
170	FB3 = 3.4 - 725.5*(-C2+B)	S1602280
	RSIG = (E*FB3)/(7.*RI4/(1. - 7.*RI4) + ZOZO)	S1602290
	SIGR20=(E*FB3)/(C6+ZOZO)	S1602300
	IF(RI4.GE.C5) GO TO 180	S1602310
	GO TO 220	S1602320
180	CONTINUE	S1602330
	RSIG = SIGR20	S1602340
	GO TO 220	S1602350
190	FB4 = 1.55 + 38.04*(B - .0008)	S1602360
	FB5 = 2.35 + 5.43*(B - C7)	S1602370
	RSIG = (E*FB4)/(7.*RI4/(1. - 7.*RI4) + ZOZO)	S1602380
	IF(B.GE.C7)RSIG = (E*FB5)/(ZOZO - 7.*RI4/(1. - 7.*RI4))	S1602390
	SIGR21=(E*FB4)/(C6+ZOZO)	S1602400
	SIGR22 = (E*FB5)/(C6+ZOZO)	S1602410
	IF(RI4.GE.C5.AND.B.LT.C7) GO TO 200	S1602420
	IF(RI4.GE.C5.AND.B.GE.C7) GO TO 210	S1602430
	GO TO 220	S1602440
200	CONTINUE	S1602450
	RSIG = SIGR21	S1602460
	GO TO 220	S1602470
210	CONTINUE	S1602480
	RSIG = SIGR22	S1602490
	GO TO 220	S1602500
C***	CHECK FOR VALID SIGAZ VALUE	S1602510
220	CONTINUE	S1602520
	IF (RSIG.LE.0. .OR. RSIG.GT.30.) RSIG = 30.	S1602530
	RETURN	S1602540
	END	S1602550

REEDM SOURCE MODULE &RCLDM

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      FTN4
      PROGRAM RCLDM(5)
      . , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700000
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700010
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700020
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700030
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700040
C:::                                     ::: S1700050
C:::                                     ::: S1700060
C::: ORGANIZATION: H. E. CRAMER CO., INC.      ::: S1700070
C:::                                     ::: S1700080
C::: WORK FOR: DR. J. B. STEPHENS (ES84)        ::: S1700090
C:::                                     ::: S1700100
C::: PROGRAM CODE: RCLDM                       ::: S1700110
C:::                                     ::: S1700120
C::: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST  ::: S1700130
C:::                                     EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER) ::: S1700140
C:::                                     ::: S1700150
C::: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS ::: S1700160
C:::                                     ::: S1700170
C::: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS      ::: S1700180
C:::                                     ::: S1700190
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700200
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700210
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700220
C *
C ***** S1700230
C *
C * NASA/MSFC MULTILAYER DIFFUSION MODEL * S1700240
C *
C * CLOUD RISE PROGRAM -- RCLDM * S1700250
C *
C * * S1700260
C *
C * * S1700270
C *
C * * S1700280
C ***** S1700290
C
C 04/02/82 S1700300
C***** BEGIN COMMON AREA *****S1700310
C-----MATH PARAMETERS AND CONSTANTS S1700320
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S1700330
C-----INPUT OPTIONS S1700340
REAL LAMBDA S1700350
INTEGER FILE,GOOD,TITLE S1700360
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S1700370
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S1700380
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S1700390
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S1700400
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S1700410
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S1700420
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S1700430
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S1700440
. FS(20),MDLNAM(12),DBAR(20) S1700450
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S1700460
LOGICAL ISNDF0,CRT,MAXDEP,BATCH,GASSET,GRVSET, S1700470
. MODEL4,MODEL5,MODEL6 S1700480
S1700490

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    INTEGER RUNNUM,RT,CL,CS                                S1700500
    COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S1700510
    . DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S1700520
    . SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S1700530
    . ,MIXING,MAXDEP,LAYBOT(3) S1700540
    . ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S1700550
    . ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S1700560
    . MINUS1,MINUS9,MINS1,MINS9, S1700570
    . MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S1700580
    . RT(24),TPROPC,IDXRT S1700590
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S1700600
    INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S1700610
    . TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S1700620
    . CLRLNE,INSLNE,DELNE S1700630
    COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S1700640
    . INVNDR(2),ULINE(2), S1700650
    . TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S1700660
    . CLRLNE,INSLNE,DELNE, S1700670
    . IESCAJ(3),NULL,IBLNK, S1700680
    . IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S1700690
C-----VEHICLE PARAMETERS S1700700
    COMMON /VCLPR/ VPAR(17) S1700710
C-----TIME PARAMETERS S1700720
    COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S1700730
    . LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2) S1700740
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S1700750
    COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S1700760
    . RH(30),PTEMP(30),SIGEP(30),SIGAP(30) S1700770
C-----LAYER PARAMETERS S1700780
    COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S1700790
    . SIGYO(29) S1700800
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS) S1700810
    COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6) S1700820
C-----CALCULATED NEW LAYER PARAMETERS S1700830
    COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S1700840
    . SPEEDN(32) S1700850
C-----CONVERSION FACTORS S1700860
    COMMON /CNVRT/ QCONV(4),QPDEPH S1700870
C S1700880
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S1700890
    COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S1700900
C-----READ/WRITE BUFFER S1700910
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S1700920
C*****S1700930
C S1700940
C-----EQUIVALENCE STATEMENTS S1700950
    EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S1700960
    . , (IPU2,IPAR(4)),(IPU3,IPAR(5)) S1700970
    EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1) S1700980
C S1700990
C**** END OF COMMON AREA ****S1701000
Cc S1701010

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NNNEST = 3	S1702060
NNNTRY = 1	S1702070
CALL REEDM	S1702080
C-----CALCULATE TURBULENCE PARAMETERS	S1702090
80 CALL TURB4	S1702100
C-----OUTPUT LAYER PARAMETERS	S1702110
WRITE(IOU,9014)	S1702120
GO TO (90,100) IPRINT	S1702130
90 WRITE(IOU,9002)	S1702140
WRITE(IOU,9003) QC,QT,HEAT,AA,BB,CC,CP,DPDZ	S1702150
C LAYER PARAMETER OUTPUT	S1702160
100 WRITE(IOU,9004)	S1702170
GO TO (110,120) IPRINT	S1702180
110 WRITE(IOU,9005)	S1702190
GO TO 130	S1702200
120 WRITE(IOU,9012)	S1702210
130 CONTINUE	S1702220
DO 170 I=1,NLAYS	S1702230
ISTAR=IBLNK	S1702240
IP1=I+1	S1702250
T1=FLOAT(INT(TAUK*10.))*1	S1702260
T2=FLOAT(INT(RISTIM(I)*10.))*1	S1702270
IF(T1.EQ.T2) ISTAR=IIHBS	S1702280
TDX=DX(I)	S1702290
TDY=DY(I)	S1702300
IF(Q(I).GT.0.0) GO TO 140	S1702310
TDX=0.0	S1702320
TDY=0.0	S1702330
140 GO TO (150,160) IPRINT	S1702340
150 WRITE(IOU,9006) I,ALT(IP1),RISTIM(I),ISTAR,TDX,TDY,Q(I)	S1702350
,SIGLL(I),SIGPP(I),SIGXO(I),SIGYO(I),SIGAP(IP1),SIGEP(IP1)	S1702360
GO TO 170	S1702370
160 WRITE(IOU,9013) I,ALT(IP1),RISTIM(I),ISTAR,TDX,TDY	S1702380
170 CONTINUE	S1702390
IF(IRUN.NE.4) GO TO 180	S1702400
WRITE(IOU,9016) (J,ALT(J),DIR(J),SPEED(J),TEMP(J),PTEMP(J),PRESS(J)	S1702410
,RH(J),SIGAP(J),SIGEP(J),J=1,NUM)	S1702420
WRITE(IOU,9017) (J,Q(J),SIGXO(J),SIGYO(J),DX(J),DY(J),RISTIM(J),	S1702430
.J=1,NUM-1)	S1702440
9016 FORMAT(/12H DIAGNOSTICS//	S1702450
,52H LEVEL,ALT,DIR,SPEED,TEMP,PTEMP,PRESS,RH,SIGAP,SIGEP/	S1702460
,21(I4,1X,9F12.5/))	S1702470
9017 FORMAT(/33H LAYER,Q,SIGXO,SIGYO,DX,DY,RISTIM/	S1702480
,20(I4,1X,6F12.5/))	S1702490
180 CONTINUE	S1702500
WRITE(IOU,9010)	S1702510
WRITE(IOU,9007) CALHT,H,TAUK	S1702520
WRITE(IOU,9008) ALT(LAYTOP(1)+1),ALT(LAYBOT(1))	S1702530
IF(HM(2).NE.0.0) WRITE(IOU,9009) ALT(LAYTOP(2)+1),ALT(LAYBOT(2))	S1702540
WRITE(IOU,9011) SIGMAR,SIGMER	S1702550
C	S1702560
C-----COMPUTE LAYER BOUNDARIES PARAMETERS	S1702570

INTEGER RUNNUM,RT,CL,CS	1700500
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	1700510
DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	1700520
SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	1700530
,MIXING,MAXDEP,LAYBOT(3)	1700540
,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	1700550
ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	1700560
MINUS1,MINUS9,MINS1,MINS9,	1700570
MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	1700580
RT(24),TPROPC,IDXRT	1700590
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	1700600
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	1700610
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	1700620
CLRLNE,INSLNE,DELIN	1700630
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	1700640
INVNDR(2),ULINE(2),	1700650
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	1700660
CLRLNE,INSLNE,DELIN,	1700670
IESCAJ(3),NULL,IBLNK,	1700680
IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	1700690
C-----VEHICLE PARAMETERS	1700700
COMMON /VCLPR/ VPAR(17)	1700710
C-----TIME PARAMETERS	1700720
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	1700730
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	1700740
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)	1700750
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),	1700760
RH(30),PTEMP(30),SIGEP(30),SIGAP(30)	1700770
C-----LAYER PARAMETERS	1700780
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),	1700790
SIGYO(29)	1700800
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)	1700810
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)	1700820
C-----CALCULATED NEW LAYER PARAMETERS	1700830
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),	1700840
SPEEDN(32)	1700850
C-----CONVERSION FACTORS	1700860
COMMON /CNVRT/ QCONV(4),QPDEPH	1700870
C	1700880
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****	1700890
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)	1700900
C-----READ/WRITE BUFFER	1700910
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879	1700920
C*****	1700930
C	1700940
C-----EQUIVALENCE STATEMENTS	1700950
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))	1700960
,(IPU2,IPAR(4)),(IPU3,IPAR(5))	1700970
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)	1700980
C	1700990
C****	1701000
END OF COMMON AREA	1701010
Cc	1701010

EQUIVALENCE (AA,VPAR(7)),(BB,VPAR(8)),(CC,VPAR(9))	S1701020
C	S1701030
DATA JVERSN/8213/	S1701040
DATA IIHBS/2H */	S1701050
CF-----FORMAT STATEMENTS.	S1701060
9001 FORMAT(88H0*** REEDM ERROR 017, NOT ENOUGH LAYERS, THE TOP OF THE	S1701070
.LAST LAYER MUST BE GREATER THAN ,F10.5)	S1701080
9002 FORMAT(1X,20(1H*),12X,15HPLUME RISE DATA,13X,20(1H*))//	S1701090
9003 FORMAT(/,1X,25HEXHAUST RATE OF MATERIAL:,16X,11H(GRAMS/SEC),9X,	S1701100
.G12.9/1X,22HTOTAL MATERIAL OUTPUT:,19X,7H(GRAMS),13X,G12.9	S1701110
./ 1X,21HHEAT OUTPUT PER GRAM:,20X,10H(CALORIES),13X,F9.4	S1701120
./1X,29HVEHICLE RISE TIME PARAMETERS:,12X,15H(TK=(A*Z**B)+C)	S1701130
.,	S1701140
2X,2HA=,8X,F5.4	S1701150
./	S1701160
59X,2HB=,8X,F5.4	S1701170
./	S1701180
59X,2HC=,8X,F5.4	S1701190
./ 1X,21HSPECIFIC HEAT OF AIR:,20X,13H(K CAL./GRAM),14X,F5.4	S1701200
./	S1701210
1X,36HVERTICAL GRADIENT OF POTENTIAL TEMP.	S1701220
./ 12X,24HTO STABILIZATION HEIGHT:,6X,10H(DEG. K/M),17X,F5.4)	S1701230
9004 FORMAT(/1X,20(1H*),10X,20H EXHAUST CLOUD ,10X,20(1H*))//	S1701240
9005 FORMAT(/62X,5HLAYER,8X,2(5HCLLOUD,5X)/6X,4HMET.,7X,3HTOP,7X,	S1701250
.5HCLLOUD,7X,17HRANGE** BEARING,5X,6HSOURCE,8X,2(5HHALF-,5X)/5X,	S1701260
.5HLAYER,4X,8HOF LAYER,3X,9HRISE TIME,	S1701270
.2(3X,8HFROM PAD),4X,8HSTRENGTH,6X,6HLENGTH,5X,5HWIDTH,5X,5HSIGXO	S1701280
.,5X,5HSIGYO,5X,5HSIGAP,5X,	S1701290
.5HSIGEP/6X,3HNO.,5X,8H(METERS),3X,9H(SECONDS),3X,8H(METERS),	S1701300
.3X,8H(METERS),5X,7H(GRAMS),5X,4(8H(METERS),2X),2(10H(DEGREES))	S1701310
./66(2H--)/)	S1701320
9006 FORMAT(7X,I2,6X,F6.1,6X,F6.1,A2,2X,F6.1,5X,F6.1,4X,G10.9,5X,F6.1	S1701330
.,4X,F6.1,4X,F6.1,4X,F6.1,4X,F6.1,4X,F6.1)	S1701340
9007 FORMAT(/1X,20(1H*),10X,20HCLLOUD STABILIZATION ,10X,20(1H*))//	S1701350
2X,18HCALCULATION HEIGHT,22X,8H(METERS),14X,F10.2, /	S1701360
2X,20HSTABILIZATION HEIGHT,20X,8H(METERS),14X,F10.2, /	S1701370
2X,18HSTABILIZATION TIME,22X,6H(SECS),16X,F10.2)	S1701380
9008 FORMAT(2X,26HFIRST MIXING LAYER HEIGHT:,14X,8H(METERS),11X,5HTOP =	S1701390
.,F8.2/61X,5HBASE=,F8.2)	S1701400
9009 FORMAT(2X,29HSECOND SELECTED LAYER HEIGHT:,11X,8H(METERS),11X,	S1701410
.5HTOP =,F8.2/61X,5HBASE=,F8.2)	S1701420
9010 FORMAT(/5X,48H * - INDICATES CLOUD STABILIZATION TIME WAS USED/	S1701430
.5X,50H** - RANGE FROM PAD IS AT CLOUD STABILIZATION TIME/)	S1701440
9011 FORMAT(/2X,25HSIGMAR(AZ) AT THE SURFACE,16X,9H(DEGREES),13X,F10.4S	S1701450
1/2X,25HSIGMER(EL) AT THE SURFACE,16X,9H(DEGREES),13X,F10.4)	S1701460
9012 FORMAT(/59X,7HAZIMUTH,/16X,4HMET.,6X,3HTOP,7X,5HCLLOUD,7X,5HRANGE,	S1701470
.,5X,7HBEARING,/15X,5HLAYER,4X,8HOF LAYER,3X,9HRISE TIME,	S1701480
.2(3X,8HFROM PAD),/16X,3HNO.,5X,8H(METERS),3X,9H(SECONDS),3X,	S1701490
.8H(METERS),3X,8H(METERS),/10X,30(2H--)/)	S1701500
9013 FORMAT(16X,I2,6X,F6.1,6X,F6.1,A2,2X,F6.1,5X,F6.1,5X,F6.1)	S1701510
9014 FORMAT(1H1)	S1701520
9015 FORMAT(38H0* PROCESSING CONTINUES WITH NEXT RUN./1H1)	S1701530
C	
C	
IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	
C-----CHECK SEGMENT ENTRY POINT.	

IF(NNNTRY .EQ. 3) GOTO 80	S1701540
C-----INITIAL CONSTANTS AND VARIABLES	S1701550
ZM=0.0	S1701560
G=9.8	S1701570
IFLG=0	S1701580
DPDZ=0.0	S1701590
C-----COMPUTE BURN RATE FACTOR(RFACT),SOURCE OUTPUT RATE(QC),	S1701600
C TOTAL OUTPUT STRENGTH(QT),HEAT OUTPUT(HEAT) AND VEHICLE RISE	S1701610
CC PARAMETERS(AA,BB,CC)	S1701620
10 RFACT = .001*((1.8*(TPROP-273.16)+32.0)-70.0)+1.0	S1701630
20 QC = RFACT*VPAR(NORMAL)	S1701640
QT = VPAR(NORMAL+3)	S1701650
HEAT = VPAR(NORMAL+9)	S1701660
C-----CALCULATE PLUME RISE - FOR DELTA LAUNCHES USE AVERAGE OF	S1701670
C INSTANTANEOUS AND CONTINUOUS PLUME RISE	S1701680
C-----INSTANTEOUS PLUME RISE	S1701690
30 LTYP = 1	S1701700
IF(NORMAL.GT.1) GO TO 40	S1701710
CALL PLUME(LTYP)	S1701720
IF(IFLG.GT.0) GO TO 190	S1701730
IF(IVHICL.LE.2) GO TO 70	S1701740
C DELTA LAUNCH - CALCULATE CONTINUOUS PLUME RISE FOR AVERAGE	S1701750
ZMSV = ZM	S1701760
GAMMAX = GAMMAC	S1701770
GAMMAY = GAMMAC	S1701780
GAMMAZ = GAMMAC	S1701790
C-----CONTINUOUS PLUME RISE	S1701800
40 LTYP = 2	S1701810
CALL PLUME(LTYP)	S1701820
IF(IFLG.GT.0) GO TO 190	S1701830
IF(IVHICL.LE.2) GO TO 70	S1701840
IF(NORMAL.GT.1) GO TO 70	S1701850
GAMMAX = .5*(GAMMAI+GAMMAC)	S1701860
GAMMAY = GAMMAX	S1701870
GAMMAZ = GAMMAX	S1701880
ZM = .5*(ZM+ZMSV)	S1701890
DO 50 I = 2,NUM	S1701900
IF(ALT(I).GE.ZM) GO TO 60	S1701910
50 CONTINUE	S1701920
60 CALL LEAST(ALT,PTEMP,DPDZ,I,0,0.0,0.0)	S1701930
IF(DPDZ.LT.3.322E-4)DPDZ = 3.322E-4	S1701940
C-----CALCULATE CLOUD TRAJECTORY AND RISE TIME USING DELXY	S1701950
70 CALL DELXY	S1701960
C-----CALCULATE SOURCE DISTRIBUTION	S1701970
CALL DIST4	S1701980
C-----CALCULATE SOURCE DIMENSION	S1701990
CALL DIMS4	S1702000
IFLG=0	S1702010
ALT(1)=0.0	S1702020
C IF(RUNNUM.GT.1) GO TO 80	S1702030
C-----CALL RDHMM	S1702040
C	S1702050

NNNEST = 3	S1702060
NNNTRY = 1	S1702070
CALL REEDM	S1702080
C-----CALCULATE TURBULENCE PARAMETERS	S1702090
80 CALL TURB4	S1702100
C-----OUTPUT LAYER PARAMETERS	S1702110
WRITE(IOU,9014)	S1702120
GO TO (90,100) IPRINT	S1702130
90 WRITE(IOU,9002)	S1702140
WRITE(IOU,9003) QC,QT,HEAT,AA,BB,CC,CP,DPDZ	S1702150
C LAYER PARAMETER OUTPUT	S1702160
100 WRITE(IOU,9004)	S1702170
GO TO (110,120) IPRINT	S1702180
110 WRITE(IOU,9005)	S1702190
GO TO 130	S1702200
120 WRITE(IOU,9012)	S1702210
130 CONTINUE	S1702220
DO 170 I=1,NLAYS	S1702230
ISTAR=IBLNK	S1702240
IP1=I+1	S1702250
T1=FLOAT(INT(TAUK*10.))*1	S1702260
T2=FLOAT(INT(RISTIM(I)*10.))*1	S1702270
IF(T1.EQ.T2) ISTAR=IIHBS	S1702280
TDX=DX(I)	S1702290
TDY=DY(I)	S1702300
IF(Q(I).GT.0.0) GO TO 140	S1702310
TDX=0.0	S1702320
TDY=0.0	S1702330
140 GO TO (150,160) IPRINT	S1702340
150 WRITE(IOU,9006) I,ALT(IP1),RISTIM(I),ISTAR,TDX,TDY,Q(I)	S1702350
. ,SIGLL(I),SIGPP(I),SIGXO(I),SIGYO(I),SIGAP(IP1),SIGEP(IP1)	S1702360
GO TO 170	S1702370
160 WRITE(IOU,9013) I,ALT(IP1),RISTIM(I),ISTAR,TDX,TDY	S1702380
170 CONTINUE	S1702390
IF(IRUN.NE.4) GO TO 180	S1702400
WRITE(IOU,9016) (J,ALT(J),DIR(J),SPEED(J),TEMP(J),PTEMP(J),PRESS(J)	S1702410
. ,RH(J),SIGAP(J),SIGEP(J),J=1,NUM)	S1702420
WRITE(IOU,9017) (J,Q(J),SIGXO(J),SIGYO(J),DX(J),DY(J),RISTIM(J),	S1702430
. J=1,NUM-1)	S1702440
9016 FORMAT(/12H DIAGNOSTICS//	S1702450
. ,52H LEVEL,ALT,DIR,SPEED,TEMP,PTEMP,PRESS,RH,SIGAP,SIGEP/	S1702460
. ,21(I4,1X,9F12.5/))	S1702470
9017 FORMAT(/33H LAYER,Q,SIGXO,SIGYO,DX,DY,RISTIM/	S1702480
. ,20(I4,1X,6F12.5/))	S1702490
180 CONTINUE	S1702500
WRITE(IOU,9010)	S1702510
WRITE(IOU,9007) CALHT,H,TAUK	S1702520
WRITE(IOU,9008) ALT(LAYTOP(1)+1),ALT(LAYBOT(1))	S1702530
IF(IM(2).NE.0.0) WRITE(IOU,9009) ALT(LAYTOP(2)+1),ALT(LAYBOT(2))	S1702540
WRITE(IOU,9011) SIGMAR,SIGMER	S1702550
C	S1702560
C-----COMPUTE LAYER BOUNDARIES PARAMETERS	S1702570

CALL RRDRM	S1702580
C	S1702590
C	S1702600
C	S1702610
190 IF(IFLG) 200,230,210	S1702620
200 WRITE(IOU,9001) ZM	S1702630
GOTO 220	S1702640
210 WRITE(IOU,9018) IFLG	S1702650
9018 FORMAT(59H *** REEDM ERROR 018, (RCLDM) PLUME RISE ERROR FLAG EQUAS	S1702660
*LS ,I2)	S1702670
C-----ERROR EXIT.	S1702680
220 IERROR(1) = 1	S1702690
WRITE(IOU,9015)	S1702700
230 CONTINUE	S1702710
NNNEST = 2	S1702720
NNNTRY = 5	S1702730
CALL REEDM	S1702740
END	S1702750

REEDM SOURCE MODULE &RCLDN

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FTN4
SUBROUTINE PLUME(LTYP)
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C
C-----S1800010
C-----S1800020
C-----S1800030
C-----S1800040
C-----S1800050
C- THIS SUBROUTINE CALCULATES CLOUD (PLUME) RISE FOR INSTANTANEOUS - S1800060
C- (NORMAL) AND CONTINUOUS (ABNORMAL) LAUNCHES - S1800070
C-----S1800080
C-----S1800090
C-----S1800100
C-----S1800110
C-----S1800120
C**** B E G I N C O M M O N A R E A ****S1800130
C 04/02/82 S1800140
C-----MATH PARAMETERS AND CONSTANTS S1800150
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S1800160
C-----INPUT OPTIONS S1800170
REAL LAMBDA S1800180
INTEGER FILE,GOOD,TITLE S1800190
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S1800200
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S1800210
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S1800220
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S1800230
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S1800240
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S1800250
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S1800260
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S1800270
. FS(20),MDLNAM(12),DBAR(20) S1800280
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S1800290
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S1800300
. MODEL4,MODEL5,MODEL6 S1800310
INTEGER RUNNUM,RT,CL,CS S1800320
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S1800330
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S1800340
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S1800350
. ,MIXING,MAXDEP,LAYBOT(3) S1800360
. ;ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S1800370
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S1800380
. MINUS1,MINUS9,MINS1,MINS9, S1800390
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S1800400
. RT(24),TPROPC,IDXRT S1800410
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S1800420
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S1800430
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S1800440
. CLRLNE,INSLNE,DELNE S1800450
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S1800460
. INVNDR(2),ULINE(2), S1800470
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S1800480
. CLRLNE,INSLNE,DELNE, S1800490
. IESCAJ(3),NULL,IBLNK,

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C
C****          E N D   O F   C O M M O N   A R E A
Cc
EQUIVALENCE (AA,VPAR(7)),(BB,VPAR(8)),(CC,VPAR(9))
ZSUM = 0.0
UBARS = 0.0
IF(LTYP.EQ.1) GO TO 10
C      CONTINUOUS
A1 = 6.0*QC*HEAT/(SURDEN*CP*PI*GAMMAX*GAMMAY)
B1 = .3333333
GO TO 20
C      INSTANTANEOUS
10 A1 = 6.0*QC*AA*HEAT/(SURDEN*CP*PI*GAMMAX*GAMMAY*GAMMAZ)
   B1 = 1.0/(4.0-BB)
20 K = 1
30 K = K+1
40 CALL LEAST(ALT,PTEMP,DPDZ,K,0,0.0,0.0)
   IF(DPDZ.LT.3.322E-4) DPDZ = 3.322E-4
   IF(LTYP.EQ.1) GO TO 50
   UBARS = UBARS+(ALT(K)-ALT(K-1))*(SPEED(K)+SPEED(K-1))*0.5
   ZSUM = ZSUM+ALT(K)-ALT(K-1)
   UBARK = UBARS/ZSUM
C      CONTINUOUS
   ZM = (A1/(UBARK*DPDZ))*B1
   GO TO 60
50 ZM = (A1/DPDZ)*B1
C      INSTANTANEOUS
   ZM = (A1/AA*(AA*ZM**BB+CC)/DPDZ)**0.25
60 IF(ZM.LE.ALT(K)) GO TO 70
   K = K+1
   IF(K.GT.NUM) GO TO 160
   GO TO 40
70 IF(ALT(K)-ZM.LE.10.0) GO TO 150
   IF(DPDZ-3.322E-4) 80,150,80
80 CONTINUE
   IF(LTYP.EQ.1) GO TO 90
   UBARK = UBARS-(ALT(K)-ALT(K-1))*(SPEED(K)+SPEED(K-1))*0.5
   ZBARK = ZSUM-(ALT(K)-ALT(K-1))
90 ZP = ALT(K)
100 ZP = ZP-10.0
   IF(ZP.LT.ALT(1)) GO TO 170
   TVP = PTEMP(K)-TPZ(ALT(K),ZP,PTEMP(K),PTEMP(K-1),ALT(K-1))
   CALL LEAST(ALT,PTEMP,DPDZ,K-1,1,ZP,TVP)
   IF(DPDZ.GT.3.322E-4) GO TO 120
   DPDZ = 3.322E-4
110 ZM = ZP
   GO TO 150
120 IF(LTYP.EQ.1) GO TO 130
   UBARZ = SPEED(K)-TPZ(ALT(K),ZP,SPEED(K),SPEED(K-1),ALT(K-1))
   UBARZ = (UBARK+(ZP-ALT(K-1))*(UBARZ+SPEED(K-1))*0.5)/(ZBARK+ZP
   .-ALT(K-1))

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S1800800
****S1800810
S1800820
S1800830
S1800840
S1800850
S1800860
S1800870
S1800880
S1800890
S1800900
S1800910
S1800920
S1800930
S1800940
S1800950
S1800960
S1800970
S1800980
S1800990
S1801000
S1801010
S1801020
S1801030
S1801040
S1801050
S1801060
S1801070
S1801080
S1801090
S1801100
S1801110
S1801120
S1801130
S1801140
S1801150
S1801160
S1801170
S1801180
S1801190
S1801200
S1801210
S1801220
S1801230
S1801240
S1801250
S1801260
S1801270
S1801280
S1801290
S1801300

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ZM = (A1/(UBARZ*DPDZ))*B1	
GO TO 140	S1801310
130 ZM = (A1/DPDZ)**B1	S1801320
ZM = (A1/AA*(AA*ZM**BB+CC)/DPDZ)**.25	S1801330
140 IF(ZM.GT.ZP) GO TO 110	S1801340
IF(ZM.GT.ZP-10.0) GO TO 150	S1801350
IF(ZP.GE.ALT(K-1)) GO TO 100	S1801360
ZM = ALT(K-1)	S1801370
C-----RETURN ZM AND DPDZ	S1801380
150 IFLG = 0	S1801390
GO TO 180	S1801400
C-----CANNOT CALCULATE ZM AND DPDZ	S1801410
160 IFLG = 1	S1801420
GO TO 180	S1801430
170 IFLG = 2	S1801440
180 RETURN	S1801450
END	S1801460
	S1801470

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SUBROUTINE DELXY
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C-----S1900000
C-----S1900010
C-----S1900020
C-----S1900030
C-----S1900040
C - THIS SUBROUTINE CALCULATES CLOUD TRAJECTORY (DX,DY) AND CLOUD -S1900050
C - RISE TIME TO EACH LEVEL (RISTIM) -S1900060
C - -S1900070
C-----S1900080
C-----S1900090
Cc-----S1900100
C****          B E G I N  C O M M O N  A R E A          ****S1900100
C 04/02/82 S1900110
C-----MATH PARAMETERS AND CONSTANTS S1900120
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S1900130
C-----INPUT OPTIONS S1900140
REAL LAMBDA S1900150
INTEGER FILE,GOOD,TITLE S1900160
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S1900170
ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S1900180
XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S1900190
IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S1900200
ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S1900210
,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S1900220
,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S1900230
TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S1900240
FS(20),MDLNAM(12),DBAR(20) S1900250
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S1900260
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S1900270
MODEL4,MODEL5,MODEL6 S1900280
INTEGER RUNNUM,RT,CL,CS S1900290
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S1900300
DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S1900310
SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S1900320
,MIXING,MAXDEP,LAYBOT(3) S1900330
,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S1900340
ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S1900350
MINUS1,MINUS9,MINS1,MINS9, S1900360
MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S1900370
RT(24),TPROPC,IDXRT S1900380
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S1900390
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S1900400
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S1900410
CLRLNE,INSLNE,DELNE S1900420
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S1900430
INVNDR(2),ULINE(2), S1900440
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S1900450
CLRLNE,INSLNE,DELNE, S1900460
IESCAJ(3),NULL,IBLNK, S1900470
IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S1900480
C-----VEHICLE PARAMETERS S1900490
COMMON /VCLPR/ VPAR(17) S1900500

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C-----TIME PARAMETERS
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
RH(30),PTEMP(30),SIGEP(30),SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
SIGYO(29)
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4),QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE (IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))
,(IPU2,IPAR(4)),(IPU3,IPAR(5))
EQUIVALENCE (MAXDEP,GRVSET),(IFRMT(1),IFRMT1)
C
C****
Cç      E N D   O F   C O M M O N   A R E A
Cç
EQUIVALENCE (AA,VPAR(7)),(BB,VPAR(8)),(CC,VPAR(9))
TT=0.0
IP=4
XL=GAMMAZ
IF(NORMAL.EQ.1) GO TO 10
IP=3
XL=1.0
10 UF=0.0
UFS=0.0
ZF=0.0
ZFS=0.0
A1=SURDEN*CP*PI*GAMMAX*GAMMAY*XL/(3.0*QC*HEAT)
IF(NORMAL.EQ.1) A1=A1/AA
B1=G/TEMP(1)
S=1.0/SQRT(G*DPDZ/TEMP(1))
PPI=PI*5.5555555E-3
TSTR=PI*S
PPII=1.0/PPI
DXX=0.0
DYY=0.0
I=0
20 I=I+1

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S1900510
S1900520
S1900530
S1900540
S1900550
S1900560
S1900570
S1900580
S1900590
S1900600
S1900610
S1900620
S1900630
S1900640
S1900650
S1900660
S1900670
S1900680
S1900690
S1900700
S1900710
S1900720
S1900730
S1900740
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S1900770
S1900780
S1900790
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S1900940
S1900950
S1900960
S1900970
S1900980
S1900990
S1901000
S1901010
S1901020

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IF(I.GE.NUM) GO TO 110
CALL LEAST(ALT,PTEMP,DPDZS,I+1,0,0.0,0.0)
IF(DPDZS.LT.3.322E-4) DPDZS=3.322E-4
BK=A1*DPDZS
IF(NORMAL.GT.1) GO TO 30
BK=BK/(ALT(I+1)**BB+CC/AA)
GO TO 40
30 UFS=UF+(ALT(I+1)-ALT(I))*(SPEED(I+1)+SPEED(I))*(.5)
ZF=ZF+(ALT(I+1)-ALT(I))
BK=BK*UFS/ZFS
40 CONTINUE
ZD=BK*ALT(I+1)**IP
IF(ZD.GT.2.0) GO TO 80
THETAK=(DIR(I+1)+DIR(I))*0.5
IF(ABS(DIR(I+1)-DIR(I)).GT.180.0) THETAK=THETAK-180.0
BBB=1.0-ZD
IF(BBB.GT.1.0) BBB=1.0
IF(BBB.LT.-1.0) BBB=-1.0
S=1.0/SQRT(B1*DPDZS)
TK=S*ARCOS(BBB)-TT
TT=TK+TT
IF(TT.LE.TSTR) GO TO 50
TT=TT-TK
GO TO 80
50 UF=UFS
ZF=ZFS
IF(NORMAL.GT.1) GO TO 60
RK=0.5*(SPEED(I+1)+SPEED(I))*TK
GO TO 70
60 RK=UF*TK/ZF
70 BBB=THETAK*PPI
DY(I)=DY(I-1)-RK*COS(BBB)
DX(I)=DX(I-1)-RK*SIN(BBB)
RISTIM(I)=TT
ILXY=I
GO TO 20
80 RK=(ZM-ALT(I))/(ALT(I+1)-ALT(I))*5*(SPEED(I+1)-SPEED(I))
+ SPEED(I)
IF(NORMAL.EQ.1) GO TO 90
RK=RK*(ZM-ALT(I))+UF
ZF=ZF+(ZM-ALT(I))
RK=RK/ZF
90 RK=RK*(TSTR-TT)
BBB=(DIR(I+1)-DIR(I))
IF(BBB.GT.180.0) BBB=BBB-360.0
IF(BBB.LT.-180.0) BBB=BBB+360.0
BBB=AMOD(BBB,360.0)
THETAM=BBB/(ALT(I+1)-ALT(I))*(ZM-ALT(I))+DIR(I)
THETAK=.5*(THETAM+DIR(I))
IF(ABS(THETAM-DIR(I)).GT.180.0) THETAK=THETAK-180.0
BBB=THETAK*PPI
DX(I)=DX(I-1)-RK*SIN(BBB)

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S1901030
S1901040
S1901050
S1901060
S1901070
S1901080
S1901090
S1901100
S1901110
S1901120
S1901130
S1901140
S1901150
S1901160
S1901170
S1901180
S1901190
S1901200
S1901210
S1901220
S1901230
S1901240
S1901250
S1901260
S1901270
S1901280
S1901290
S1901300
S1901310
S1901320
S1901330
S1901340
S1901350
S1901360
S1901370
S1901380
S1901390
S1901400
S1901410
S1901420
S1901430
S1901440
S1901450
S1901460
S1901470
S1901480
S1901490
S1901500
S1901510
S1901520
S1901530
S1901540

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DY(I)=DY(I-1)-RK*COS(BBB)	S1901550
RISTIM(I)=TSTR	S1901560
ILXY=I	S1901570
100 I=I+1	S1901580
IF(I.GE.NUM) GO TO 110	S1901590
RK=TSTR*.5*(SPEED(I+1)+SPEED(I))	S1901600
ZF=(DIR(I+1)+DIR(I))*0.5	S1901610
IF(ABS(DIR(I+1)-DIR(I)).GT.180) ZF=ZF-180.0	S1901620
BBB=ZF*PPI	S1901630
DX(I)=-RK*SIN(BBB)	S1901640
DY(I)=-RK*COS(BBB)	S1901650
RISTIM(I)=TSTR	S1901660
GO TO 100	S1901670
110 CONTINUE	S1901680
I=NUM-1	S1901690
DO 140 J=1,I	S1901700
IF(DX(J).EQ.0.0 .AND. DY(J).EQ.0.0) GO TO 140	S1901710
TT = 0.5*(SPEED(J+1)+SPEED(J))*(TSTR-RISTIM(J))	S1901720
BBB = 0.5*(DIR(J+1)+DIR(J))	S1901730
IF (ABS(DIR(J+1)-DIR(J)) .GT. 180.0) BBB = BBB-180.0	S1901740
BBB = (BBB+180.0)*PPI	S1901750
UF = DX(J)+TT*SIN(BBB)	S1901760
ZF = DY(J)+TT*COS(BBB)	S1901770
BBB=270.0-ATAN2(ZF,UF)*PPII	S1901780
IF(BBB.GT.360.0) BBB=BBB-360.0	S1901790
IF(BBB.GT.180.0) GO TO 120	S1901800
BBB=BBB+180.0	S1901810
GO TO 130	S1901820
120 BBB=BBB-180.0	S1901830
130 DX(J) = SQRT(UF*UF+ZF*ZF)	S1901840
DY(J)=BBB	S1901850
140 CONTINUE	S1901860
RETURN	S1901870
END	S1901880

SUBROUTINE TURB4	S2000000
., UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S2000010
C	S2000020
C-----	S2000030
C	S2000040
C	S2000050
C - THIS SUBROUTINE CALCULATES THE STANDARD DEVIATION OF THE WIND	S2000060
C - AZIMUTH AND WIND ELEVATION ANGLES	S2000070
C	S2000080
C-----	S2000090
Cc	S2000100
C**** BEGIN COMMON AREA ****	S2000110
C 04/02/82	S2000120
C-----MATH PARAMETERS AND CONSTANTS	S2000130
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S2000140
C-----INPUT OPTIONS	S2000150
REAL LAMBDA	S2000160
INTEGER FILE,GOOD,TITLE	S2000170
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S2000180
ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S2000190
XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S2000200
IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S2000210
ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S2000220
,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S2000230
,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S2000240
TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S2000250
FS(20),MDLNAM(12),DBAR(20)	S2000260
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S2000270
LOGICAL ISNDF0,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S2000280
MODEL4,MODEL5,MODEL6	S2000290
INTEGER RUNNUM,RT,CL,CS	S2000300
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S2000310
DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S2000320
SIGZ,ISNDF0,CRT,LAYTOP(3),ITDU,KEEP	S2000330
,MIXING,MAXDEP,LAYBOT(3)	S2000340
,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S2000350
ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S2000360
MINUS1,MINUS9,MINUS1,MINUS9,	S2000370
MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S2000380
RT(24),TPROPC,IDXRT	S2000390
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S2000400
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S2000410
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S2000420
CLRLNE,INSLNE,DELNE	S2000430
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S2000440
INVNDR(2),ULINE(2),	S2000450
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S2000460
CLRLNE,INSLNE,DELNE,	S2000470
IESCAJ(3),NULL,IBLNK,	S2000480
IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S2000490
C-----VEHICLE PARAMETERS	S2000500
COMMON /VCLPR/ VPAR(17)	

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C-----TIME PARAMETERS
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
      LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
      RH(30),PTEMP(30),SIGEP(30),SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
      SIGYO(29)
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
      SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4),QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))
      ,(IPU2,IPAR(4)),(IPU3,IPAR(5))
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)
C
C****          E N D   O F   C O M M O N   A R E A          ****
Cc
C
PHI1 = G*DPDZ/TEMP(1)
TAUK = PI/SQRT(PHI1)
IF(TAUK.GT.600.0 .OR. TAUK.LE.0.0) TAUK = 600.0
K = 0
IF(ISIG.EQ.1) GO TO 40
10 K = K+1
IF(K.GT.NUM) GO TO 40
IF(ALT(K).EQ.HM(1)) GO TO 20
IF(ALT(K).GT.HM(1)) GO TO 30
SIGAP(K) = .5*SIGMAR
SIGEP(K) = .5*SIGMER
GO TO 10
20 SIGAP(K)=SIGMAR*.37037037
SIGEP(K)=SIGMER*.37037037
GO TO 10
30 SIGAP(K) = 1.0
SIGEP(K) = 1.0
GO TO 10
40 RETURN
END

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SUBROUTINE DIST4
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C-----S2100000
C-----S2100010
C-----S2100020
C-----S2100030
C-----S2100040
C-----S2100050
C-----S2100060
C-----S2100070
C-----S2100080
C-----S2100090
C****          B E G I N C O M M O N   A R E A          ****
C    04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
.             ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
.             XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
.             IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
.             ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
.             ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)
.             ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
.             TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
.             FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDF0,CRT,MAXDEP,BATCH,GASSET,GRVSET,
.             MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
.             DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
.             SIGZ,ISNDF0,CRT,LAYTOP(3),ITDU,KEEP
.             ,MIXING,MAXDEP,LAYBOT(3)
.             ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
.             ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
.             MINUS1,MINUS9,MINSL,MINSL9,
.             MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
.             RT(24),TPROPC,IDXRT
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
.             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.             CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
.             INVNDR(2),ULINE(2),
.             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.             CLRLNE,INSLNE,DELNE,
.             IESCAJ(3),NULL,IBLNK,
.             IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
C-----VEHICLE PARAMETERS
COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS

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COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S2100510
                  LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2) S2100520
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S2100530
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S2100540
                  RH(30),PTEMP(30),SIGEP(30),SIGAP(30) S2100550
C-----LAYER PARAMETERS S2100560
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGX0(29), S2100570
                  SIGY0(29) S2100580
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS) S2100590
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6) S2100600
C-----CALCULATED NEW LAYER PARAMETERS S2100610
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S2100620
                  SPEEDN(32) S2100630
C-----CONVERSION FACTORS S2100640
COMMON /CNVRT/ QCONV(4),QPDEPH S2100650
C S2100660
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S2100670
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S2100680
C-----READ/WRITE BUFFER S2100690
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S2100700
C*****S2100710
C S2100720
C-----EQUIVALENCE STATEMENTS S2100730
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S2100740
                  ,(IPU2,IPAR(4)),(IPU3,IPAR(5)) S2100750
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1) S2100760
C S2100770
C**** E N D O F C O M M O N A R E A ****S2100780
Cq S2100790
EQUIVALENCE (AA,VPAR(7)),(BB,VPAR(8)),(CC,VPAR(9)) S2100800
DOUBLE PRECISION D0,D1,D2,D3,D4,D5,D6 S2100810
DATA D1/4.9867347D-2/,D2/2.11410061D-2/,D3/3.2776263D-3/ S2100820
DATA D4/3.80036D-5/, D5/4.88906D-5/, D6/5.383D-6/ S2100830
IF(NORMAL.GT.1) GO TO 10 S2100840
QQ = QC*(AA*ZM**BB+CC) S2100850
GO TO 20 S2100860
10 QQ = QT S2100870
20 IF(ISHAPE.EQ.2) GO TO 30 S2100880
SQ2I = 1.0/(GAMMAZ*ZM*.465116279) S2100890
PHI = 0.0 S2100900
GO TO 40 S2100910
30 SQ2I = 0.75/(GAMMAZ*ZM) S2100920
PHI = 1.0/(3.0*(GAMMAZ*ZM)**2) S2100930
ZTC = ZM*(1.0+GAMMAZ) S2100940
ZBC = ZM*(1.0-GAMMAZ) S2100950
40 K = 1 S2100960
50 K = K+1 S2100970
IF(ISHAPE.EQ.2) GO TO 100 S2100980
IFLG = 0 S2100990
ZP = (ALT(K)-ZM)*SQ2I S2101000
IF (ZP) 70,60,80 S2101010
60 PZ = .5 S2101020

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GO TO 90	S2101030
70 ZP = -ZP	S2101040
IFLG = 1	S2101050
80 DO = 1.0-0.5*(1.0+ZP*(D1+ZP*(D2+ZP*(D3+ZP*(D4+ZP*(D5+ZP*D6))))))**	S2101060
(-16)	S2101070
PZ = DO	S2101080
IF(IFLG.EQ.1) PZ = 1.0-PZ	S2101090
90 PZP = PZ-PHI	S2101100
GO TO 110	S2101110
100 PZP = 0.0	S2101120
ZT = ALT(K)	S2101130
ZB = ALT(K-1)	S2101140
IF(ZB.GT.ZTC .OR. ZT.LT.ZBC) GO TO 110	S2101150
IF(ZT.GT.ZTC) ZT = ZTC	S2101160
IF(ZB.LT.ZBC) ZB = ZBC	S2101170
PZP = SQ2I*((ZT-ZB)-((ZT-ZM)**3-(ZB-ZM)**3)*PHI)	S2101180
110 Q(K-1) = PZP*QQ	S2101190
IF(Q(K-1) .LT. 0.0) Q(K-1) = 0.0	S2101200
IF(ISHAPE.EQ.1 .AND. Q(K-1).LT.1.0E-20) QQ = 0.0	S2101210
IF(ISHAPE.EQ.1) PHI = PZ	S2101220
IF(K.LT.NUM) GO TO 50	S2101230
IF(NORMAL.GT.1) GO TO 140	S2101240
K=2	S2101250
ZP=ZM	S2101260
120 IF(ALT(K).GE.ZM) GO TO 130	S2101270
K=K+1	S2101280
IF(K.LE.NUM) GO TO 120	S2101290
GO TO 140	S2101300
130 IF(K.GT.NUM) GO TO 140	S2101310
Q(K-1) = QC*AA*(ALT(K)**BB-ZP**BB)+Q(K-1)	S2101320
ZP = ALT(K)	S2101330
K = K+1	S2101340
GO TO 130	S2101350
140 CONTINUE	S2101360
RETURN	S2101370
END	S2101380

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SUBROUTINE DIMS4
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C-----S2200C00
C-----S2200010
C-----S2200020
C - THIS SUBROUTINE CALCULATES THE SOURCE DIMENSIONS AT EACH LAYER -S2200030
C - AND THE CLOUD RISE HEIGHT (H) -S2200040
C - -S2200050
C-----S2200060
C-----S2200070
C*
C****          B E G I N C O M M O N   A R E A          S2200080
C 04/02/82          ****S2200090
C-----MATH PARAMETERS AND CONSTANTS          S2200100
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC          S2200110
C-----INPUT OPTIONS          S2200120
REAL LAMBDA          S2200130
INTEGER FILE,GOOD,TITLE          S2200140
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,          S2200150
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,          S2200160
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,          S2200170
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,          S2200180
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)          S2200190
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)          S2200200
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),          S2200210
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),          S2200220
. FS(20),MDLNAM(12),DBAR(20)          S2200230
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES          S2200240
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,          S2200250
. MODEL4,MODEL5,MODEL6          S2200260
INTEGER RUNNUM,RT,CL,CS          S2200270
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,          S2200280
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,          S2200290
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP          S2200300
. ,MIXING,MAXDEP,LAYBOT(3)          S2200310
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,          S2200320
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),          S2200330
. MINUS1,MINUS9,MINI1,MINI9,          S2200340
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,          S2200350
. RT(24),TPROPC,IDXRT          S2200360
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.          S2200370
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,          S2200380
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,          S2200390
. CLRLNE,INSLNE,DELNE          S2200400
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),          S2200410
. INVNDR(2),ULINE(2),          S2200420
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,          S2200430
. CLRLNE,INSLNE,DELNE,          S2200440
. IESCAJ(3),NULL,IBLNK,          S2200450
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)          S2200460
C-----VEHICLE PARAMETERS          S2200470
COMMON /VCLPR/ VPAR(17)          S2200480
C-----TIME PARAMETERS          S2200490
S2200500

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COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
RH(30),PTMP(30),SIGEP(30),SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DX,DY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
SIGYO(29)
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4),QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))
,(IPU2,IPAR(4)),(IPU3,IPAR(5))
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)
C
C**** END OF COMMON AREA ****
Cc
C
A=GAMMAX*ZM
B=GAMMAY*ZM
C=GAMMAZ*ZM
CINV=1.0/C
ZTC=ZM+C
ZBC=ZM-C
DO 50 K=2,NUM
ZB = ALT(K-1)
ZT=ALT(K)
IF(K.EQ.2) ZB=0.0
ZP = .5*(ZT+ZB)
SXO=0.0
SYO=0.0
IF(ZB.GT.ZTC.OR.ZT.LT.ZBC) GO TO 20
IF(ZT.GT.ZTC) ZT=ZTC
IF(ZB.LT.ZBC) ZB=ZBC
ZO=ABS(ZP-ZM)
ZTEST=ZO*CINV
IF(ZTEST.LT.1.0) GO TO 10
ZP=.5*(ZT+ZB)
ZO=ABS(ZP-ZM)
10 FAC=(1-(ZO*ZO)*(CINV*CINV))

```

S2200510
S2200520
S2200530
S2200540
S2200550
S2200560
S2200570
S2200580
S2200590
S2200600
S2200610
S2200620
S2200630
S2200640
S2200650
S2200660
S2200670
S2200680
S2200690
S2200700
S2200710
S2200720
S2200730
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S2200890
S2200900
S2200910
S2200920
S2200930
S2200940
S2200950
S2200960
S2200970
S2200980
S2200990
S2201000
S2201010
S2201020

FAC=FAC**.	5	
SXO = A*FAC		S2201030
SYO = B*FAC		S2201040
20 IF(ISHAPE .EQ. 2 .OR. SXO .GT. 0.0 .OR. ZP .GE. ZM) GOTO 30		S2201050
SXO = 50.0		S2201060
SYO = 50.0		S2201070
30 IF(NORMAL.GT.1) GO TO 40		S2201080
IF(ZP.LE.ZM) GO TO 40		S2201090
IF(SXO.LT.199.95) SXO=199.95		S2201100
IF(SYO.LT.199.95) SYO=199.95		S2201110
40 SIGLL(K-1) = SXO		S2201120
SIGPP(K-1) = SYO		S2201130
SIGXO(K-1)=SXO*.465116279		S2201140
SIGYO(K-1)=SYO*.465116279		S2201150
50 CONTINUE		S2201160
H = ZM		S2201170
RETURN		S2201180
END		S2201190
		S2201200

SUBROUTINE LEAST(ALT,PTEMP,DPDZ,K,ISW,ZP,TVP)
 . , UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC

C

```

    DIMENSION ALT(1),PTEMP(1)
    IF(K.LE.1) GO TO 50
    L = K
    TVB = 0.0
    ZB = 0.0
    DO 10 I = 1,K
    TVB = TVB + PTEMP(I)
10  ZB = ZB + ALT(I)
    IF(ISW.EQ.0) GO TO 20
    TVB = TVB + TVP
    ZB = ZB + ZP
    L = L + 1
20  TVB = TVB/FLOAT(L)
    ZB = ZB/FLOAT(L)
    S1 = 0.0
    S2 = 0.0
    DO 30 I = 1,K
    S1 = S1+(ALT(I)-ZB)*(PTEMP(I)-TVB)
30  S2 = S2+(ALT(I)-ZB)**2
    IF(ISW.EQ.0) GO TO 40
    S1 = S1+(ZP-ZB)*(TVP-TVB)
    S2 = S2+(ZP-ZB)**2
40  DPDZ = S1/S2
50  CONTINUE
    RETURN
    END
  
```

S2300000
 S2300010
 S2300020
 S2300030
 S2300040
 S2300050
 S2300060
 S2300070
 S2300080
 S2300090
 S2300100
 S2300110
 S2300120
 S2300130
 S2300140
 S2300150
 S2300160
 S2300170
 S2300180
 S2300190
 S2300200
 S2300210
 S2300220
 S2300230
 S2300240
 S2300250
 S2300260
 S2300270
 S2300280

FUNCTION TPZ(A,B,C,D,E)	S2400000
. , UPDATE: 8213 SOURCE: 16 DEC 81 LOCATION: KSC	S2400010
C -----	S2400020
TPZ = (A-B)*(C-D)/(A-E)	S2400030
RETURN	S2400040
END	S2400050


```

FUNCTION ARCOS(X)
. , UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC
C -----
C THIS RELATION HOLDS FOR ALL PRINCIPAL VALUES OF X.
C 1.570796 = PI/2.
  ARCOS = 0.0
  IF (X-1.0) 10,20,10
10 ARCOS = 1.570796 - ATAN(X/SQRT(1.-X*X))
20 RETURN
END

```

```

S2500000
S2500010
S2500020
S2500030
S2500040
S2500050
S2500060
S2500070
S2500080
S2500090

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SUBROUTINE RRDRM		26000000
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC		26000010
C		26000020
C	26000030
C	:	26000040
C	: THIS SUBROUTINE COMPUTES THE NEW LAYER BOUNDARIES AND	26000050
C	: PARAMETERS.	26000060
C	:	26000070
C	26000080
C		26000090
Cc		26000100
C****	BEGIN COMMON AREA	****26000110
C	04/02/82	26000120
C-----	MATH PARAMETERS AND CONSTANTS	26000130
	COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	26000140
C-----	INPUT OPTIONS	26000150
	REAL LAMBDA	26000160
	INTEGER FILE,GOOD,TITLE	26000170
	COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	26000180
	ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	26000190
	XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	26000200
	IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	26000210
	ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	26000220
	,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	26000230
	,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	26000240
	TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	26000250
	FS(20),MDLNAM(12),DBAR(20)	26000260
C-----	COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	26000270
	LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	26000280
	MODEL4,MODEL5,MODEL6	26000290
	INTEGER RUNNUM,RT,CL,CS	26000300
	COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	26000310
	DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	26000320
	SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	26000330
	,MIXING,MAXDEP,LAYBOT(3)	26000340
	,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	26000350
	ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	26000360
	MINUS1,MINUS9,MINS1,MINS9,	26000370
	MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	26000380
	RT(24),TPROPC,IDXRT	26000390
C-----	TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	26000400
	INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	26000410
	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	26000420
	CLRLNE,INSLNE,DELNE	26000430
	COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	26000440
	INVNDR(2),ULINE(2),	26000450
	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	26000460
	CLRLNE,INSLNE,DELNE,	26000470
	IESCAJ(3),NULL,IBLNK,	26000480
	IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	26000490
C-----	VEHICLE PARAMETERS	26000500

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COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
RH(30),PTEMP(30),SIGEP(30),SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
SIGYO(29)
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4),QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))
,(IPU2,IPAR(4)),(IPU3,IPAR(5))
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)
C
C**** END OF COMMON AREA ****
C
REAL MPWR
DIMENSION ANG(30),DIREC(3)
CF-----OUTPUT FORMATS
9001 FORMAT(1H1,10(1H*),3X,48H"CALCULATED INPUT METEOROLOGICAL LAYER PARS",
AMETERS,4X,10(1H*)//2X,4HMET.,19X,4HWIND,19X,4HWIND,/
.2X,5HLAYER,7X,4HWIND,7X,5HSPEED,8X,4HWIND,5X,9HDIRECTION,
.3X,8HSIGMA OF,4X,8HSIGMA OF/3X,3HNO.,7X,5HSPEED,7X,5HSHEAR,5X,
.9HDIRECTION,3X,9H SHEAR ,4X,7HAZI ANG,5X,7HELE ANG/
.,11X,7H(M/SEC),5X,7H(M/SEC),6X,5H(DEG),19X,5H(DEG),7X,5H(DEG))
9002 FORMAT(1X,40(2H--))
9003 FORMAT(3X,I2,3X,4(2X,F10.2),2(2X,F10.4))
9004 FORMAT(/1X,16(1H*),4X,38H"CALCULATED TRANSITION LAYER PARAMETERS",
.5X,16(1H*))
9005 FORMAT(/26H"TRANSITION LAYER NUMBER: ",I2,/)
9006 FORMAT(40X,4HWIND,14X,4HWIND,/
.2X,5HVALUE,24X,4HWIND,4X,5HSPEED,5X,4HWIND,4X,5H DIR.,4X
.,5HSIGMA,4X,5HSIGMA,/3X,2HAT,6X,6HHEIGHT,4X,5HTEMP.,4X,5HSPEED,4X
.,5HSHEAR,5X,4HDIR.,4X,5HSHEAR,5X,4HAZI.,5X,4HELE./
.,9X,8H(METERS),1X,7H(DEG K),3X,7H(M/SEC),13X,5H(DEG),13X,
.5H(DEG),5X,5H(DEG)/40(2H--))

```

9007	FORMAT(1X,7HTOP: ,3(1X,F8.2),10X,F8.2,9X,2(1X,F8.4))	S2601030
9008	FORMAT(1X,7HLAYER: ,18X,4(1X,F8.2),2(1X,F8.4))	S2601040
9009	FORMAT(1X,7HBOTTOM: ,3(1X,F8.2),10X,F8.2,9X,2(1X,F8.4)/40(2H--))	S2601050
9010	FORMAT(38H0* PROCESSING CONTINUES WITH NEXT RUN./1H1)	S2601060
C		S2601070
C	-----INITIALIZE SOME CONSTANTS AND VARIABLES	S2601080
	RAD=.01745329	S2601090
	NLAYS=NUM-1	S2601100
	ZRL=ZRK	S2601110
	II=-1	S2601120
C	-----CALCULATE NEW LAYER BOUNDRY PARAMETERS	S2601130
	DO 10 I=1,NBK	S2601140
	II=II+2	S2601150
	IJ=II+1	S2601160
	NTAL=LAYBOT(I)	S2601170
	NTAK=LAYTOP(I)+1	S2601180
	SPEEDB(II)=SPEED(NTAL)	S2601190
	SPEEDB(IJ)=SPEED(NTAK)	S2601200
C	SIGAPB(II)=SIGAP(NTAL)	S2601210
C	SIGAPB(IJ)=SIGAP(NTAK)	S2601220
C	SIGEPB(II)=SIGEP(NTAL)	S2601230
C	SIGEPB(IJ)=SIGEP(NTAK)	S2601240
	DIRB(II)=DIR(NTAL)	S2601250
	DIRB(IJ)=DIR(NTAK)	S2601260
	TEMPB(II)=PTMP(NTAL)	S2601270
	TEMPB(IJ)=PTMP(NTAK)	S2601280
	10 CONTINUE	S2601290
C	-----CALCULATE PARAMETERS FOR SUBLAYERS (1 TO NLAYS)	S2601300
C	TAUOK=TAUK	S2601310
C	TAUOL=TAUOK	S2601320
C	TAUL=TAUK	S2601330
C	STO1=((TAUK/TAUOK)**.2)*RAD	S2601340
C	STO2=((TAUK/600.0)**.2)*RAD	S2601350
	TAUOK=600.0	S2601360
	FAC=(TAUK/TAUOK)**.2	S2601370
	S=ALT(2)/ZRK	S2601380
	S1=1.0/ALOGT(S)	S2601390
C	-----COMPUTE SPEED,SIGMAP,SIGMEP FOR ALL SUBLAYERS	S2601400
C	*** LAYER 1 ***	S2601410
	P=RB8(SPEED(2),SPEED(1),S1)	S2601420
	SPEEDN(1)=RB11(SPEED(1),P,ALT(2),ZRK)	S2601430
	PPWR=P	S2601440
C	P=RB8(SIGAP(2),SIGAP(1),S1)	S2601450
C	SIGAPN(1)=STO1*RB11(SIGAP(1),P,ALT(2),ZRK)	S2601460
C	MPWR=P	S2601470
C	P=RB8(SIGEP(2),SIGEP(1),S1)	S2601480
C	SIGEPN(1)=RB11(SIGEP(1),P,ALT(2),ZRK)*RAD	S2601490
C	QPWR=P	S2601500
	IF(NLAYS.LT.2) GO TO 30	S2601510
C	*** LAYERS 2 TO NLAYS ***	S2601520
	DO 20 I=2,NLAYS	S2601530
	J=I+1	S2601540

SPEEDN(I)=.5*(SPEED(J)+SPEED(I))	S2601550
C SIGAPN(I)=.5*STO2*(SIGAP(J)+SIGAP(I))	S2601560
C 12 SIGEPN(I)=.5*RAD*(SIGEP(J)+SIGEP(I))	S2601570
20 CONTINUE	S2601580
C-----CALCULATE WIND DIRECTION AND WIND SHEAR FOR SUBLAYERS	S2601590
C *** LAYERS 1 TO NLAYS ***	S2601600
30 DO 90 I=1,NLAYS	S2601610
J=I+1	S2601620
IF(ISIG.EQ.1) GO TO 40	S2601630
IF(ALT(J).NE.HM(1)) GO TO 40	S2601640
SIGAPN(I)=SIGAP(I)*FAC	S2601650
SIGEPN(I)=SIGEP(I)*FAC	S2601660
GO TO 50	S2601670
40 SIGAPN(I)=.5*(SIGAP(J)+SIGAP(I))*FAC	S2601680
SIGEPN(I)=.5*(SIGEP(J)+SIGEP(I))*FAC	S2601690
50 IF(SIGAPN(I).LT.1.0) SIGAPN(I)=1.0	S2601700
IF(SIGEPN(I).LT.1.0) SIGEPN(I)=1.0	S2601710
DIRN(I)=.5*(DIR(J)+DIR(I))	S2601720
IF(ABS(DIR(J)-DIR(I)).LE.180.0) GO TO 60	S2601730
DIRN(I)=DIRN(I)-180.0	S2601740
60 DDIR(I)=DIR(J)-DIR(I)	S2601750
IF(DDIR(I).LE.180.0) GO TO 70	S2601760
DDIR(I)=360.0-DDIR(I)	S2601770
70 IF(DDIR(I).GE.-180.0) GO TO 80	S2601780
DDIR(I)=DDIR(I)+360.0	S2601790
80 DSPEED(I)=SPEED(J)-SPEED(I)	S2601800
IF(DSPEED(I).GE.0.0) GO TO 90	S2601810
IF((PTEMP(J)-PTEMP(I)).GT.0.0) GO TO 90	S2601820
DSPEED(I)=ABS(DSPEED(I))	S2601830
90 CONTINUE	S2601840
C-----CALCULATE PARAMETERS FOR NEW LAYERS (1 TO NBK)	S2601850
IF(ISIG.EQ.1) GO TO 110	S2601860
DO 100 I=1,NBK	S2601870
NLAYS1=NLAYS+I	S2601880
M1=LAYBOT(I)	S2601890
M2=LAYTOP(I)	S2601900
SIGAPN(NLAYS1)=.5*RAD*(SIGAP(M2)*FAC+SIGAP(M1)*FAC)	S2601910
SIGEPN(NLAYS1)=.5*RAD*(SIGEP(M2)*FAC+SIGEP(M1)*FAC)	S2601920
100 CONTINUE	S2601930
GO TO 130	S2601940
110 DO 130 I=1,NBK	S2601950
IF(IRUN.EQ.4) WRITE(IOU,9011) I	S2601960
9011 FORMAT(/22H DIAGNOSTICS FOR LAYER,I2,16H FOR SIGMA,SIGME)	S2601970
NLAYS1=NLAYS+I	S2601980
M1=LAYBOT(I)	S2601990
M2=LAYTOP(I)	S2602000
M21=M2+1	S2602010
DPLAY=ALT(M21)-ALT(M1)	S2602020
DPLAYI=1/DPLAY	S2602030
TMP1=0.0	S2602040
TMP2=0.0	S2602050
DO 120 J=M1,M2	S2602060

K=J+1	S2602070
ALTD=ALT(K)-ALT(J)	S2602080
TMP1=TMP1+(ALTD*(0.5*RAD*FAC*(SIGAP(K)+SIGAP(J))))	S2602090
TMP2=TMP2+(ALTD*(0.5*RAD*FAC*(SIGEP(K)+SIGEP(J))))	S2602100
IF(IRUN.EQ.4) WRITE(IOU,9012) J,K,ALT(J),ALT(K),SIGAP(J),SIGAP(K)	S2602110
.,SIGEP(J),SIGEP(K),ALTD,FAC,TMP1,TMP2	S2602120
9012 FORMAT(3H J=,I2,3H K=,I2,8H ALT(J)=,F10.3,	S2602130
.8H ALT(K)=,F10.3,10H SIGAP(J)=,F10.5,10H SIGEP(K)=,F10.5,	S2602140
.10H SIGEP(J)=,F10.5,10H SIGEP(K)=,F10.5/6H ALTD=,F10.3,5H FAC=,	S2602150
.F10.5,6H TMP1=,F10.5,6H TMP2=,F10.5)	S2602160
120 CONTINUE	S2602170
SIGAPN(NLAYSI)=TMP1*DPLAYI	S2602180
SIGEPN(NLAYSI)=TMP2*DPLAYI	S2602190
130 CONTINUE	S2602200
C-----CALCULATE WIND SPEED AND DIRECTION FOR TRANSITION LAYERS	S2602210
DO 240 I=1,NBK	S2602220
NLAYSI=NLAYSI+I	S2602230
IBDX1=2*I-1	S2602240
IBDX2=2*I	S2602250
M1=LAYBOT(I)	S2602260
M2=LAYTOP(I)	S2602270
M21=M2+1	S2602280
S=0.0	S2602290
DO 140 J=M1,M2	S2602300
JJ=J+1	S2602310
140 S=S+.5*(SPEED(J)+SPEED(JJ))*(ALT(JJ)-ALT(J))	S2602320
SPEEDN(NLAYSI)=S/(ALT(M21)-ALT(M1))	S2602330
T1=DIR(M1)	S2602340
T2=0.0	S2602350
ANG(M1)=T1	S2602360
S=0.0	S2602370
DO 170 J=M1,M2	S2602380
JJ=J+1	S2602390
T2=DIR(JJ)	S2602400
IF(ABS(T2-T1).LE.180.0) GO TO 160	S2602410
IF(T2.GT.T1) GO TO 150	S2602420
T2=T2+360.0	S2602430
GO TO 160	S2602440
150 T2=T2-360.0	S2602450
160 P=.5*(T2+T1)	S2602460
T1=T2	S2602470
ANG(JJ)=T1	S2602480
170 S=S+P*(ALT(JJ)-ALT(J))	S2602490
DIRN(NLAYSI)=S/(ALT(M21)-ALT(M1))	S2602500
C-----CALCULATE WIND DIRECTION SHEAR FOR ALL LAYERS	S2602510
T1=0.0	S2602520
T2=0.0	S2602530
DO 180 J=M1,M21	S2602540
T1=T1+ALT(J)	S2602550
180 T2=T2+ANG(J)	S2602560
P=1.0/FLOAT(M21-M1+1)	S2602570
T2=T2*P	S2602580

T1=T1*P	S2602590
P=0.0	S2602600
S=0.0	S2602610
DO 190 J=M1,M21	S2602620
P=P+(ALT(J)-T1)*(ANG(J)-T2)	S2602630
TTT=(ABS(ALT(J)-T1)**2)	S2602640
S=S+TTT	S2602650
190 CONTINUE	S2602660
DDIR(NLAYSI)=(ALT(M21)-ALT(M1))*P/S	S2602670
IF(DDIR(NLAYSI).LE.180.0) GO TO 200	S2602680
DDIR(NLAYSI)=360.0-DDIR(NLAYSI)	S2602690
200 IF(DDIR(NLAYSI).GE.-180.0) GO TO 210	S2602700
DDIR(NLAYSI)=360.0+DDIR(NLAYSI)	S2602710
C-----CALCULATE CHANGE IN WIND SPEED FOR ALL NEW LAYERS	S2602720
210 T1=0.0	S2602730
T2=0.0	S2602740
DO 220 J=M1,M21	S2602750
T1=T1+SPEED(J)	S2602760
T2=T2+ALT(J)	S2602770
220 CONTINUE	S2602780
P=1.0/FLOAT(M21-M1+1)	S2602790
T1=T1*P	S2602800
T2=T2*P	S2602810
P=0.0	S2602820
S=0.0	S2602830
DO 230 J=M1,M21	S2602840
P=P+(ALT(J)-T2)*(SPEED(J)-T1)	S2602850
TTT=(ABS(ALT(J)-T2)**2)	S2602860
S=S+TTT	S2602870
230 CONTINUE	S2602880
DSPEED(NLAYSI)=(ALT(M21)-ALT(M1))*P/S	S2602890
IF(DSPEED(NLAYSI).GE.0.0) GO TO 240	S2602900
IF((TEMPB(IBDX2)-TEMPB(IBDX1)).GT.0.0) GO TO 240	S2602910
DSPEED(NLAYSI)=ABS(DSPEED(NLAYSI))	S2602920
240 CONTINUE	S2602930
250 IF(IPRINT.GT.1) GO TO 290	S2602940
C-----OUTPUT LAYER PARAMETERS	S2602950
260 WRITE(IOU,9001)	S2602960
WRITE(IOU,9002)	S2602970
DO 270 I=1,NLAYS	S2602980
DIRNP=DIRN(I)	S2602990
IF(DIRNP.LT.0.0) DIRNP=DIRNP+360.0	S2603000
IF(DIRNP.GT.360.0) DIRNP=DIRNP-360.0	S2603010
WRITE(IOU,9003) I,SPEEDN(I),DSPEED(I),DIRNP,DDIR(I),SIGAPN(I)	S2603020
. ,SIGEPN(I)	S2603030
270 CONTINUE	S2603040
WRITE(IOU,9004)	S2603050
DO 290 I=1,NBK	S2603060
J=2*I	S2603070
K=J-1	S2603080
L=NLAYS+I	S2603090
M=LAYTOP(I)+1	S2603100

N=LAYBOT(I)	S2603110
DIREC(1)=DIRB(J)	S2603120
DIREC(2)=DIRN(L)	S2603130
DIREC(3)=DIRB(K)	S2603140
SIGMA=SIGAPN(L)*57.2958	S2603150
SIGME=SIGEPN(L)*57.2958	S2603160
DO 280 IDX=1,3	S2603170
IF(DIREC(IDX).LT.0.0) DIREC(IDX)=DIREC(IDX)+360.0	S2603180
IF(DIREC(IDX).GT.360.0) DIREC(IDX)=DIREC(IDX)-360.0	S2603190
280 CONTINUE	S2603200
SIGMA1=SIGAP(M)*FAC	S2603210
SIGME1=SIGEP(M)*FAC	S2603220
SIGMA2=SIGAP(N)*FAC	S2603230
SIGME2=SIGEP(N)*FAC	S2603240
WRITE(IOU,9005) I	S2603250
WRITE(IOU,9006)	S2603260
WRITE(IOU,9007) ALT(M),TEMPB(J),SPEEDB(J),DIREC(1),SIGMA1,SIGME1	S2603270
WRITE(IOU,9008) SPEEDN(L),DSPEED(L),DIREC(2),DDIR(L),SIGMA,SIGME	S2603280
WRITE(IOU,9009) ALT(N),TEMPB(K),SPEEDB(K),DIREC(3),SIGMA2,SIGME2	S2603290
290 CONTINUE	S2603300
RETURN	S2603310
END	S2603320

FUNCTION RB8(A,B,C)
., UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC
RB8=ALOGT(A/B)*C
IF(RB8+1.0) 20,10,20
10 RB8=-.999999
20 RB8=RB8+1.0
RETURN
END

S2700000
S2700010
S2700020
S2700030
S2700040
S2700050
S2700060
S2700070

FUNCTION RB11(A,B,C,D)
., UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC
RB11=A*(C**B-D**B)/(B*(C-D)*D**(B-1.0))
RETURN
END

S2800000
S2800010
S2800020
S2800030
S2800040

REEDM SOURCE MODULE &RMMRM

FTN4	S2900000
PROGRAM RMMRM(5,120)	S2900010
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S2900020
C**** DECLARATIONS.	S2900030
C	S2900040
Cc	S2900050
C**** BEGIN COMMON AREA	****S2900060
C 04/02/82	S2900070
C-----MATH PARAMETERS AND CONSTANTS	S2900080
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S2900090
C-----INPUT OPTIONS	S2900100
REAL LAMBDA	S2900110
INTEGER FILE,GOOD,TITLE	S2900120
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S2900130
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S2900140
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S2900150
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S2900160
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S2900170
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S2900180
. ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S2900190
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S2900200
. FS(20),MDLNAM(12),DBAR(20)	S2900210
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S2900220
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S2900230
. MODEL4,MODEL5,MODEL6	S2900240
INTEGER RUNNUM,RT,CL,CS	S2900250
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S2900260
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S2900270
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S2900280
. ,MIXING,MAXDEP,LAYBOT(3)	S2900290
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S2900300
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S2900310
. MINUS1,MINUS9,MIN51,MIN59,	S2900320
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S2900330
. RT(24),TPROPC,IDXRT	S2900340
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S2900350
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S2900360
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S2900370
. CLRLNE,INSLNE,DELNE	S2900380
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S2900390
. INVNDR(2),ULINE(2),	S2900400
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S2900410
. CLRLNE,INSLNE,DELNE,	S2900420
. IESCAJ(3),NULL,IBLNK,	S2900430
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S2900440
C-----VEHICLE PARAMETERS	S2900450
COMMON /VCLPR/ VPAR(17)	S2900460
C-----TIME PARAMETERS	S2900470
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	S2900480
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	S2900490

C-----	SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)	S2900500
	COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),	S2900510
	RH(30),PTEMP(30),SIGEP(30),SIGAP(30)	S2900520
C-----	LAYER PARAMETERS	S2900530
	COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),	S2900540
	SIGYO(29)	S2900550
C-----	CALCULATED BOUNDARY DATA (FOR NEW LAYERS)	S2900560
	COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)	S2900570
C-----	CALCULATED NEW LAYER PARAMETERS	S2900580
	COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),	S2900590
	SPEEDN(32)	S2900600
C-----	CONVERSION FACTORS	S2900610
	COMMON /CNVRT/ QCONV(4),QPDEPH	S2900620
C		S2900630
C*****	COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****	S2900640
	COMMON /EXTRA/ NCON(1), NTOTAL(1), PLUS(900)	S2900650
C-----	READ/WRITE BUFFER	S2900660
C-----	A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S	S2900670
C*****		S2900680
C		S2900690
	DATA JVERSN/8213/	S2900700
C		S2900710
	CALL RMPAR(IFRMT)	S2900720
	IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S2900730
	GO TO (10,20),IFRMT(3)	S2900740
10	CALL RMFRM(IFRMT)	S2900750
	GO TO 30	S2900760
20	CALL RMETM	S2900770
30	CALL REEDM	S2900780
	STOP	S2900790
	END	S2900800

SUBROUTINE RMFRM(IPASS)	S3000000
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S3000010
C::	S3000020
C::	S3000030
C:::	S3000040
C:::	S3000050
C::: ORGANIZATION: H. E. CRAMER CO., INC.	S3000060
C:::	S3000070
C::: WORK FOR: DR. J. B. STEPHENS (ES84)	S3000080
C:::	S3000090
C::: PROGRAM CODE: RMETM	S3000100
C:::	S3000110
C::: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST	S3000120
C::: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER)	S3000130
C:::	S3000140
C::: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS	S3000150
C:::	S3000160
C::: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS	S3000170
C:::	S3000180
C::	S3000190
C::	S3000200
C	S3000210
C *****	S3000220
C *	S3000230
C * THIS PROGRAM GENERATES A METEOROLOGICAL PROFILE OF A SOUNDING	S3000240
C * ON THE PLOTTER	S3000250
C *	S3000260
C *****	S3000270
C	S3000280
C	S3000290
CF FORMAT STATEMENTS	S3000300
CF	S3000310
9001 FORMAT (I2,1XA2,A1,1XI4)	S3000320
9002 FORMAT (I4)	S3000330
9003 FORMAT (F6.1)	S3000340
9004 FORMAT (4I4)	S3000350
C	S3000360
C TYPE AND DIMENSION STATEMENTS	S3000370
C	S3000380
INTEGER STARS,CRSPC,SETTAB,TAB,TAB2,OFF,BKARO,BLNKNG,XRITEL,	S3000390
. CLRTAB,CLRDSP,CURLFT,CURSDN,DELIN,CLRLNE,CR,CURSUP,ULINE	S3000400
. ,ALTSET	S3000410
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S3000420
. INVNDR(2),ULINE(2),	S3000430
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S3000440
. CLRLNE,INSLNE,DELIN,	S3000450
. IESCAJ(3),NULL,IBLNK,	S3000460
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S3000470
DIMENSION WSX(30),DTX(30),PTX(30),WDX(30),CURVEY(30),IPASS(2)	S3000480
DIMENSION XAX(3),YAX(3),XLINQ(38),YLINQ(22)	S3000490
DIMENSION IALTL(8),IP(5)	S3000500
DIMENSION IXNUM(13),IYNUM(26)	S3000510

	DIMENSION AWDIR(30)	S3000520
	DIMENSION XL(5),YL(5),IDT(8),IPT(8),IWS(8),IWD(7)	S3000530
	DIMENSION ISURLO(41),ISURL1(53)	S3000540
	DIMENSION ISTL(12)	S3000550
	DIMENSION LABALT(6)	S3000560
	DIMENSION IPGEN(24),IHT(5)	S3000570
	DIMENSION IWDL(9),IALPHA(10),IREG(2),IBUFR(33)	S3000580
	DIMENSION IMET(2),ITOPV(2),IBOTV(2)	S3000590
	DIMENSION IN(2),XRITEL(6)	S3000600
C		S3000610
C		S3000620
C	EQUIVALENCE STATEMENT	S3000630
	EQUIVALENCE (STBALT,H),(IN,IN1),(IREG,REG,IA),(IREG(2),IB)	S3000640
	. , (XLINQ(4),XLINQ4),(XLINQ(6),XLINQ6),(XLINQ(8),XLINQ8)	S3000650
	. , (XLINQ(10),XLINQA),(XLINQ(12),XLINQC)	S3000660
	. , (XLINQ(14),XLINQE),(XLINQ(16),XLINQG)	S3000670
	. , (XLINQ(19),XLINQJ),(XLINQ(21),XLINQL)	S3000680
	. , (XLINQ(24),XLINQO),(XLINQ(27),XLINQR)	S3000690
	. , (XLINQ(29),XLINQT),(XLINQ(31),XLINQV)	S3000700
	. , (XLINQ(33),XLINQX),(XLINQ(35),XLINQY)	S3000710
	. , (XLINQ(37),XLINQZ)	S3000720
	EQUIVALENCE (YLINQ(4),YLINQ4),(YLINQ(6),YLINQ6),(YLINQ(8),YLINQ8)	S3000730
	. , (YLINQ(11),YLINQB),(YLINQ(13),YLINQD)	S3000740
	. , (YLINQ(16),YLINQG),(YLINQ(19),YLINQJ)	S3000750
	. , (YLINQ(21),YLINQL)	S3000760
C		S3000770
C		S3000780
C	DATA STATEMENTS	S3000790
	DATA CRSPC/6440B/	S3000800
	DATA LABALT/2HAL,2HTI,2HTU,2HDE,2H (,2HM)/	S3000810
	DATA IEXP3/2H3 /	S3000820
	DATA ISTL/2HSP,2HEE,2HD(,2HM/,2HS)	S3000830
	. ,2H ,2HTE,2HMP,2H(D,2HEG,2H C,2H) /	S3000840
	DATA ISURLO/2HDA,2HTE,2H: ,8*2H ,	S3000850
	. 2H T,2HIM,2HE:,7*2H ,	S3000860
	. 2H P,2HLO,2HTT,2HED,2H A,2HT:,5*2H ,	S3000870
	. 2HFR,2HOM,2H F,2HIL,2HE:,4*2H /	S3000880
	DATA ISURL1/2HSU,2HRE,2HAC,2HE ,2HPR,2HES,2HSU,2HRE,2H: ,3*2H ,	S3000890
	. 2H M,2HB ,2*2H ,	S3000900
	. 2HDE,2HNS,2HIT,2HY:,4*2H ,2HG/,2HM ,2*2H ,	S3000910
	. 2H @,2H -,2H S,2HTA,2HB ,2HHT,2H: ,3*2H ,2H M,2*2H ,	S3000920
	. 2H *,2H* ,2H- ,2HCA,2HLC,2H H,2HT:,4*2H ,2HM /	S3000930
	DATA XLINQ/ 0.0, 0.0, 5.0	S3000940
	. , 20.0, 55.0	S3000950
	. , 181.0, 216.0	S3000960
	. , 20.0, 139.0	S3000970
	. , 244.0, 300.0	S3000980
	. , 419.0, 503.0	S3000990
	. , 601.0, 692.0	S3001000
	. , 460.0, 100.0, 100.0	S3001010
	. , 310.0, 460.0	S3001020
	. , 726.0, 726.0, 506.0	S3001030

.	,763.0,768.0,768.0	S3001040
.	,308.0,336.0	S3001050
.	, 95.0,102.0	S3001060
.	,731.0,724.0	S3001070
.	,100.0,106.0	S3001080
.	,321.0,398.0	S3001090
.	,468.0,538.0/	S3001100
.	DATA YLINQ/ 5.0, 0.0, 0.0	S3001110
.	,488.0,488.0	S3001120
.	,473.0,473.0	S3001130
.	, 90.0, 90.0,378.0	S3001140
.	, 70.0, 70.0	S3001150
.	,378.0, 90.0, 90.0	S3001160
.	,512.0,512.0,507.0	S3001170
.	, 88.0, 92.0	S3001180
.	, 68.0, 72.0/	S3001190
.	DATA IDT/2HDR,2HY ,2HTE,2HMP,2H (,2HDE,2HG ,2HC)/	S3001200
.	DATA IPT/2HPO,2HT ,2HTE,2HMP,2H (,2HDE,2HG ,2HC)/	S3001210
.	DATA IMINUS/1H-/	S3001220
.	DATA IWS/2HWI,2HND,2H S,2HPE,2HED,2H (,2HM/,2HS)/	S3001230
.	DATA IWD/2HWI,2HND,2H D,2HIR,2H (,2HDE,2HG)/	S3001240
.	DATA IALT/2H A,2H L,2H T,2H I,2H T,2H U,2H D,2H E/	S3001250
.	DATA IXNUM/2H10,2H-5,2H 0,2H 5,2H10,2H15,2H20,2H25,2H30,2H35,	S3001260
.	2H40,2H45,2H50/	S3001270
.	DATA IYNUM/2H ,2H 0,2H 3,2H00,2H 6,2H00,2H 9,2H00,2H12,2H00,	S3001280
.	12H15,2H00,2H18,2H00,2H21,2H00,2H24,2H00,2H27,2H00,2H30,2H00	S3001290
.	,2H33,2H00,2H36,2H00/	S3001300
.	DATA IMET/2H(M,1H)/	S3001310
.	DATA XRITEL/2H 0,2H 2,2H 4,2H 6,2H 8,2H10/	S3001320
.	DATA BKARO,CR /20137B,15B/	S3001330
.	DATA IHF/1HF/	S3001340
C		S3001350
C****	FIRST EXECUTABLE STATEMENT.	S3001360
C		S3001370
	IPU1 = IPASS(1)	S3001380
	IN1 = IAND(IPASS(2),177400B) + 40B	S3001390
C		S3001400
	IF (IPAR(1) .EQ. 98) CALL LURQ(1,IPU1,1)	S3001410
C	CALL SUBROUTINES PLTLU,SFACT, AND LLEFT TO INITIALIZE PLOTTER.	S3001420
C		S3001430
	10 CALL PLTLU(IPU1)	S3001440
	CALL SFACT(7.68,5.12)	S3001450
	CALL LLEFT	S3001460
	20 WRITE(ICU,9005) BLNKNG,OFF,BKARO	S3001470
	9005 FORMAT(10X,2A2,15HFORM GENERATION,3A2)	S3001480
C		S3001490
C*	*****	S3001500
C		S3001510
C	THIS PROGRAM DRAWS THE MET PLOT FORM	S3001520
C		S3001530
C*	*****	S3001540
C		S3001550

C		S3001560
C	DRAW LOWER LEFT POSITION MARK	S3001570
C		S3001580
C	CALL LINQ(XLINQ,YLINQ,3,0)	S3001590
C		S3001600
C	DRAW THE DATE, TIME, LOCATION, AND FILENAME LABELS	S3001610
C		S3001620
C	CALL CHARQ(20.0,490.0,0,ISURL0,74,2,1)	S3001630
	CALL LINQ(XLINQ4,YLINQ4,2,0)	S3001640
	CALL LINQ(XLINQ6,YLINQ4,2,0)	S3001650
	CALL LINQ(XLINQY,YLINQ4,2,0)	S3001660
	CALL LINQ(XLINQZ,YLINQ4,2,0)	S3001670
C		S3001680
C	DRAW THE SURFACE PRESSURE, DENSITY,	S3001690
C	STABILIZATION HEIGHT, AND CALCULATION HEIGHT LABELS	S3001700
C		S3001710
	CALL CHARQ(20.0,475.0,0,ISURL1,105,2,1)	S3001720
	CALL LINQ(XLINQ8,YLINQ6,2,0)	S3001730
	CALL LINQ(XLINQA,YLINQ6,2,0)	S3001740
	CALL CHARQ(377.0,478.0,0,IEXP3,1,2,1)	S3001750
	CALL LINQ(XLINQC,YLINQ6,2,0)	S3001760
	CALL LINQ(XLINQE,YLINQ6,2,0)	S3001770
C		S3001780
C	PRINT SURFACE AND OTHER REQUIRED HEADERS.	S3001790
C		S3001800
C		S3001810
C	DRAW ALTITUDE LABEL	S3001820
C		S3001830
C	30 CALL CHARQ(30.0,435.0,0,LABALT,12,2,1)	S3001840
C		S3001850
C	DRAW DRY TEMPERATURE LABEL	S3001860
C		S3001870
C	CALL CHARQ(30.0,425.0,0,IDT,16,2,1)	S3001880
C		S3001890
C	DRAW POTENTIAL TEMPERATURE LABEL	S3001900
C		S3001910
C	CALL CHARQ(30.0,415.0,0,IPT,16,2,1)	S3001920
C		S3001930
C	DRAW WIND SPEED LABEL	S3001940
C		S3001950
C	CALL CHARQ(30.0,405.0,0,IWS,16,2,1)	S3001960
C		S3001970
C	DRAW WIND DIRECTION LABEL	S3001980
C		S3001990
C	CALL CHARQ(30.0,395.0,0,IWD,14,2,1)	S3002000
C		S3002010
C	DRAW X AND Y AXES	S3002020
C		S3002030
C	CALL LINQ(XLINQG,YLINQ8,3,0)	S3002040
C		S3002050
C	DRAW X AXIS LABELS	S3002060
C		S3002070

.	CALL CHARQ(100.0,70.0,0,ISTL,24,2,1)	S3002080
C		S3002090
C	DRAW TICK MARKS ON X AXIS	S3002100
C		S3002110
	TIC = 70.0	S3002120
	COORD = 62.0	S3002130
	DO 40 I=1,13	S3002140
	TIC = TIC + 30.0	S3002150
	XL(1) = TIC	S3002160
	XL(2) = TIC	S3002170
	CALL LINQ(XL,YLINQJ,2,0)	S3002180
	XL(1) = XL(1) + 15.0	S3002190
	XL(2) = XL(1)	S3002200
	IF(I .NE. 13)CALL LINQ(XL,YLINQJ,2,0)	S3002210
	COORD = COORD + 30.0	S3002220
	IF(I .EQ. 1)CALL CHARQ(84.0,80.0,0,IMINUS,1,2,1)	S3002230
	40 CALL CHARQ(COORD,80.0,0,IXNUM(I),2,2,1)	S3002240
C		S3002250
C	DRAW WIND DIRECTION AXIS	S3002260
C		S3002270
	CALL LINQ(XLINQJ,YLINQB,2,0)	S3002280
C		S3002290
C	DRAW WIND DIRECTION AXIS LABEL	S3002300
C		S3002310
	CALL CHARQ(336.0,50.0,0,IWD,14,2,1)	S3002320
C		S3002330
C	DRAW TICK MARKS ON WIND DIRECTION AXIS	S3002340
C		S3002350
	XL(1)=295.0	S3002360
	TIC = 15.0	S3002370
	DO 50 I=1,11	S3002380
	XL(1)=XL(1)+ TIC	S3002390
	XL(2)=XL(1)	S3002400
	50 CALL LINQ(XL,YLINQL)	S3002410
C		S3002420
C	DRAW TICK MARKS ON Y AXIS [LEFT SIDE]	S3002430
C		S3002440
	TIC = 66.0	S3002450
	N = 1	S3002460
	DO 60 I=1,13	S3002470
	TIC = TIC + 24.0	S3002480
	YL(1) = TIC	S3002490
	YL(2) = TIC	S3002500
	CALL CHARQ(64.0,YL-2.5,0,IYNUM(N),4,2,1)	S3002510
	N = N + 2	S3002520
	60 CALL LINQ(XLINQT,YL,2,0)	S3002530
C		S3002540
C	DRAW Y AXIS LABEL	S3002550
C		S3002560
	COORD = 344.0	S3002570
	DO 70 I=1,8	S3002580
	COORD = COORD - 20.0	S3002590

70	CALL CHARQ(30.0,COORD,0,IALTL(I),2,2,1)	S3002600
	CALL CHARQ(30.0,COORD-20.0,0,IMET,3,2,1)	S3002610
C		S3002620
C	DRAW RIGHT HAND X AND Y AXES	S3002630
C		S3002640
	CALL LINQ(XLINQL,YLINQD,3,0)	S3002650
	TIC=484.0	S3002660
	COORD=496.0	S3002670
	DO 80 I=0,10,2	S3002680
	TIC=TIC+22.0	S3002690
	XL(1)=TIC	S3002700
	XL(2)=TIC	S3002710
	CALL LINQ(XL,YLINQJ,2,0)	S3002720
	TIC=TIC+22.0	S3002730
	XL(1)=TIC	S3002740
	XL(2)=TIC	S3002750
	IF(I.LT.10) CALL LINQ(XL,YLINQJ,2,0)	S3002760
	CALL CODE	S3002770
	CALL CHARQ(COORD,80.0,0,XRITEL(I/2+1),2,2,1)	S3002780
	COORD=COORD+44.0	S3002790
	80 CONTINUE	S3002800
C		S3002810
C	LABEL RIGHT HAND X AXIS	S3002820
C		S3002830
	CALL CODE	S3002840
	WRITE(IALPHA,9006)	S3002850
9006	FORMAT(30HRANGE ALONG MEAN WIND DIR (KM))	S3002860
	CALL CHARQ(513.0,70.0,0,IALPHA,30,2,1)	S3002870
C		S3002880
C	DRAW TIC MARKS ON RIGHT HAND Y AXIS	S3002890
C		S3002900
	TIC=66.0	S3002910
	N = 1	S3002920
	DO 90 I=1,13	S3002930
	TIC=TIC+24.0	S3002940
	YL(1)=TIC	S3002950
	YL(2)=TIC	S3002960
	CALL CHARQ(734.0,YL-2.5,0,IYNUM(N),4,2,1)	S3002970
	CALL LINQ(XLINQV,YL,2,0)	S3002980
	N = N + 2	S3002990
	90 CONTINUE	S3003000
C		S3003010
C	DRAW UPPER RIGHT POSITION MARK	S3003020
C		S3003030
	CALL LINQ(XLINQO,YLINQG,3,0)	S3003040
C		S3003050
C	REMOVE "FORM GENERATION"	S3003060
C		S3003070
	WRITE(ICU,9007) CR,CLRDSP,BKARO.	S3003080
9007	FORMAT(50A2)	S3003090
C		S3003100
	CALL URITE	S3003110

C	CHECK FOR "F"	S3003120
C		S3003130
	IF(IN1.EQ.IHF) GO TO 110	S3003140
100	WRITE(ICU,9008) BLNKNG,OFF,INVNDR,INV,OFF,ULINE,OFF,BKARO	S3003150
9008	FORMAT(57H DO YOU WANT TO PLOT ANOTHER METEOROLOGICAL PROFILE FORMS	S3003160
	.?/5X,2A2,30HCHANGE PLOT PAPER BEFORE A YES,2A2	S3003170
	. ,14X,1H(,2A2,1HY,2A2,2HES,2A2,4H OR ,2A2,1HN,2A2,2HO),A2)	S3003180
	READ (ICU,9007) IN1	S3003190
	WRITE(ICU,9007) CURSUP,CURSUP,CR,CLRDSP,BKAKO	S3003200
	IF (IN1.EQ.IBLNK.OR.IN1.EQ.IYSJ.OR.IN1.EQ.IYESJ) GO TO 20	S3003210
	IF (IN1.EQ. INJ.OR.IN1 .EQ. INOJ) GO TO 110	S3003220
	WRITE (ICU,9009) INV,OFF,0,0	S3003230
	GO TO 100	S3003240
9009	FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S3003250
	*,I2,1H.,I1/)	S3003260
110	CONTINUE	S3003270
	RETURN	S3003280
	END	S3003290

C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S3100000
C																		S3100010
C																		S3100020
C																		S3100030
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S3100040
																		S3100050
																		S3100060
																		S3100070
																		S3100080
																		S3100090
																		S3100100
10																		S3100110
																		S3100120
																		S3100130
																		S3100140

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SUBROUTINE LINQ(X,Y,LEN,IDUM)
. , UPDATE: 8213 SOURCE: 18 JAN 79 LOCATION: KSC
DIMENSION X(1),Y(1)
CALL PLOT(.01*X(1),.01*Y(1),3)
DO 10 I=2,LEN
CALL PLOT(.01*X(I),.01*Y(I),2)
10 CONTINUE
CALL PLOT(.01*X(LEN),.01*Y(LEN),3)
RETURN
END

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REEDM SOURCE MODULE &RMMRN

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FTN4
SUBROUTINE RMETM
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200000
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200010
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200020
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200030
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200040
C::: S3200050
C::: S3200060
C::: ORGANIZATION: H. E. CRAMER CO., INC. S3200070
C::: S3200080
C::: WORK FOR: DR. J. B. STEPHENS (ES84) S3200090
C::: S3200100
C::: PROGRAM CODE: RMETM S3200110
C::: S3200120
C::: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST S3200130
C::: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER) S3200140
C::: S3200150
C::: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS S3200160
C::: S3200170
C::: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS S3200180
C::: S3200190
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200200
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200210
C S3200220
C ***** S3200230
C * S3200240
C * THIS PROGRAM GENERATES A METEOROLOGICAL PROFILE OF A SOUNDING * S3200250
C * ON THE PLOTTER * S3200260
C * S3200270
C ***** S3200280
C S3200290
C S3200300
C**** BEGIN COMMON AREA *****S3200300
C 04/02/82 S3200310
C-----MATH PARAMETERS AND CONSTANTS S3200320
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S3200330
C-----INPUT OPTIONS S3200340
REAL LAMBDA S3200350
INTEGER FILE,GOOD,TITLE S3200360
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S3200370
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S3200380
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S3200390
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S3200400
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S3200410
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S3200420
. ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S3200430
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S3200440
. FS(20),MDLNAM(12),DBAR(20) S3200450
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S3200460
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S3200470
. MODEL4,MODEL5,MODEL6 S3200480
INTEGER RUNNUM,RT,CL,CS S3200490

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COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,      S3200500
.   DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,             S3200510
.   SIGZ,ISNDF0,CRT,LAYTOP(3),ITDU,KEEP                       S3200520
.   ,MIXING,MAXDEP,LAYBOT(3)                                   S3200530
.   ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,                 S3200540
.   ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),                 S3200550
.   MINUS1,MINUS9,MINS1,MINS9,                                  S3200560
.   MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,          S3200570
.   RT(24),TPROPC,IDXRT                                         S3200580
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.  S3200590
.   INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,                 S3200600
.   TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,        S3200610
.   CLRLNE,INSLNE,DELIN                                         S3200620
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),     S3200630
.   INVNDR(2),ULINE(2),                                         S3200640
.   TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,        S3200650
.   CLRLNE,INSLNE,DELIN,                                       S3200660
.   IESCAJ(3),NULL,IBLNK,                                       S3200670
.   IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)                  S3200680
C-----VEHICLE PARAMETERS                                     S3200690
COMMON /VCLPR/ VPAR(17)                                         S3200700
C-----TIME PARAMETERS                                       S3200710
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,      S3200720
.   LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)                S3200730
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S3200740
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),   S3200750
.   RH(30),PTEMP(30),SIGEP(30),SIGAP(30)                       S3200760
C-----LAYER PARAMETERS                                       S3200770
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S3200780
.   SIGYO(29)                                                    S3200790
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)            S3200800
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)                      S3200810
C-----CALCULATED NEW LAYER PARAMETERS                        S3200820
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S3200830
.   SPEEDN(32)                                                    S3200840
C-----CONVERSION FACTORS                                     S3200850
COMMON /CNVRT/ QCONV(4),QPDEPH                                  S3200860
C                                                                S3200870
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S3200880
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)                   S3200890
C-----READ/WRITE BUFFER                                     S3200900
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S3200910
C*****S3200920
C                                                                S3200930
C-----EQUIVALENCE STATEMENTS                                S3200940
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))          S3200950
.   ,(IPU2,IPAR(4)),(IPU3,IPAR(5))                             S3200960
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)                 S3200970
C                                                                S3200980
C****          E N D   O F   C O M M O N   A R E A          ****S3200990
Cc                                                    S3201000
C                                                    S3201010

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DIMENSION RANGE(30,6),BEARNG(30,6),SIGYBR(30,6),CORSG(30,6)	S3201020
. ,RCORSG(6),BCORSG(6),XCORSG(6)	S3201030
C-----EQUIVALENCE STATEMENTS	S3201040
EQUIVALENCE	S3201050
. (PLUS,RANGE),(PLUS(181),BEARNG),(PLUS(361),SIGYBR)	S3201060
. ,(PLUS(541),XCORSG),(PLUS(547),CORSG),(PLUS(727),RCORSG)	S3201070
. ,(PLUS(733),BCORSG)	S3201080
EQUIVALENCE (PLUS(735),LOOP)	S3201090
C	S3201100
CF FORMAT STATEMENTS	S3201110
CF	S3201120
9001 FORMAT (I2,1XA2,A1,1XI4)	S3201130
9002 FORMAT (I4)	S3201140
9003 FORMAT (F6.1)	S3201150
9004 FORMAT (4I4)	S3201160
C	S3201170
C TYPE AND DIMENSION STATEMENTS	S3201180
C	S3201190
INTEGER STARS,CRSPC,BKARO,CR,BKAKO,ZIP	S3201200
DIMENSION WSX(30),DTX(30),PTX(30),WDX(30),CURVEY(30)	S3201210
DIMENSION XAX(3),YAX(3),XLINQ(2)	S3201220
DIMENSION AWDIR(30)	S3201230
DIMENSION XL(5),YL(5)	S3201240
DIMENSION ISURT(20)	S3201250
DIMENSION ICRVT(4)	S3201260
DIMENSION LALAB1(3),LALAB2(3),LALAB(16)	S3201270
DIMENSION IHT(5)	S3201280
DIMENSION IWDL(9),IALPHA(15)	S3201290
DIMENSION ITOPV(2),IBOTV(2),ZIP(5)	S3201300
DIMENSION IN(2)	S3201310
C	S3201320
C DATA STATEMENTS	S3201330
C	S3201340
DATA CRSPC/6440B/	S3201350
DATA LALAB1/2HLA,2HYE,2HR1/	S3201360
DATA LALAB2/2HLA,2HYE,2HR2/	S3201370
DATA LALAB/16*2H /	S3201380
DATA IWDL/270,0,90,180,270,360,90,180,270/	S3201390
DATA STARS/2H**/	S3201400
DATA ICRVT/2HWS,2HDT,2HPT,2HWD/	S3201410
DATA XLINQ/100.0,106.0/	S3201420
DATA ISURT /2HSU,2HRE,2HAC,2HE ,16*2H /	S3201430
DATA ITOPV/2H T,2HOP/, IBOTV/2H B,2HOT/	S3201440
DATA BKARO,CR,BKAKO,ZIP	S3201450
. /20137B,15B,137B,5*0/	S3201460
DATA IHAT/1H@/	S3201470
C	S3201480
C**** STATEMENT FUNCTIONS:	S3201490
C	S3201500
PLIM(R)=AMAX1(100.0,AMIN1(460.0,6.0*R+160.0))	S3201510
C	S3201520
C**** FIRST EXECUTABLE STATEMENT.	S3201530

C		S3201540
	10 IF(GOOD.NE.0) GO TO 20	S3201550
	WRITE(ICU,9005) DELINE,CLRDSP,SETTAB,CR,BKAKO	S3201560
	9005 FORMAT(2A2,32X3A2)	S3201570
	9006 FORMAT(50A2)	S3201580
	9007 FORMAT(10X,2A2,8HPLOTTING,3A2)	S3201590
C		S3201600
C		S3201610
C	DETERMINE SOME X AND Y COORDINATES AND TOTAL NUMBER OF POINTS	S3201620
C	FOR THE CURVES	S3201630
C		S3201640
	20 IF(GOOD .GT. 0) WRITE(ICU,9006) (CURSUP,I=-1,LOOP),DELINE,	S3201650
	1 (CURSDN,I=1,LOOP)	S3201660
	IKND = IBLNK	S3201670
	IF (CRT) IKND = BKARO	S3201680
	IF(GOOD.GE.0) WRITE(ICU,9007) BLNKNG,OFF,IKND	S3201690
	CALL PLTLU(IPU1)	S3201700
	CALL SFACT(7.68,5.12)	S3201710
	CALL LLEFT	S3201720
	IF(GOOD.NE.0) GO TO 110	S3201730
	30 DO 40 I=1,NUM	S3201740
	IF(ALT(I) .GE. 3600.0)GO TO 50	S3201750
	CURVEY(I) = ALT(I) * 0.08 + 90.0	S3201760
	40 AWDIR(I) = DIR(I)	S3201770
	I = NUM + 1	S3201780
	50 ILP = I - 1	S3201790
C		S3201800
C	CALL SUBROUTINE TO ROTATE WIND DIRECTION FOR PLOTTING	S3201810
C		S3201820
	CALL WINDS(AWDIR,ILP,ISC)	S3201830
	COORD=293.0	S3201840
	DO 60 I=0,5	S3201850
	CALL CODE	S3201860
	WRITE(IALPHA,9002) IWDL(ISC+1)	S3201870
	CALL CHARQ(COORD,60.0,0,IALPHA,4,2,1)	S3201880
	60 COORD=COORD+30.0	S3201890
C		S3201900
C****	CALCULATE PLOTTER COORDINATES FOR WIND SPEED	S3201910
C****	TEMPERATURE, AND POTENTIAL TEMPERATURE.	S3201920
C		S3201930
	DO 70 I=1,ILP	S3201940
	WSX(I) = PLIM(SPEED(I))	S3201950
	DTX(I) = PLIM(TEMP(I)-273.15)	S3201960
	PTX(I) = PLIM(PTEMP(I)-273.15)	S3201970
	70 WDX(I) = ABS(AWDIR(I)) * 0.333333 + 310.0	S3201980
C		S3201990
C	WRITE THE DATE, TIME OF THE DATA, INSTALLATION, AND DATA FILENAS	S3202000
C		S3202010
	CALL CODE	S3202020
	WRITE (IALPHA,9001) ISDAY,ISMON(1),ISMON(2),ISYEAR	S3202030
	CALL CHARQ(69.,490.,0,IALPHA,11,2,1)	S3202040
	CALL CODE	S3202050

	WRITE (IALPHA,9002) ISTIME	S3202060
	IF(IALPHA(1).LT.30000B) IALPHA(1)=IALPHA(1)+10000B	S3202070
	CALL CHARQ(230.,490.,0,IALPHA,4,2,1)	S3202080
	CALL CHARQ(258.0,490.0,0,LSDT,4,2,1)	S3202090
	IF(IPLACE .EQ. 0)GO TO 80	S3202100
	I = IPLACE - IPLACE/3	S3202110
	CALL CHARQ(412.0,490.0,0,LOCATN,4,2,1)	S3202120
	CALL CHARQ(552.0,490.0,0,FILE,6,2,1)	S3202130
C		S3202140
C	WRITE THE SURFACE PRESSURE, DENSITY, STABILIZATION HEIGHT	S3202150
C	AND CALCULATION HEIGHT.	S3202160
C		S3202170
80	CALL CODE	S3202180
	WRITE (IALPHA,9003) PRESS(1)	S3202190
	CALL CHARQ(153.0,475.0,0,IALPHA,6,2,1)	S3202200
	CALL CODE	S3202210
	WRITE (IALPHA,9003) SURDEN	S3202220
	CALL CHARQ(314.0,475.0,0,IALPHA,6,2,1)	S3202230
	CALL CODE	S3202240
	WRITE (IALPHA,9003) H	S3202250
	CALL CHARQ(517.0,475.0,0,IALPHA,6,2,1)	S3202260
	CALL CODE	S3202270
	WRITE(IALPHA,9003) CALHT	S3202280
	IALPHA(2)=MAX0(IALPHA(2),20060B)	S3202290
	CALL CHARQ(706.0,475.0,0,IALPHA,6,2,1)	S3202300
C		S3202310
C	DRAW THE WIND SPEED LINE	S3202320
C		S3202330
	CALL PLOTQ(WSX,CURVEY,ILP,1)	S3202340
	COORD = CURVEY(ILP) + 3.0	S3202350
	CALL CHARQ(WSX(ILP),COORD,0,ICRVT(1),2,2,1)	S3202360
C		S3202370
C	DRAW THE DRY TEMPERATURE LINE	S3202380
C		S3202390
	CALL PLOTQ(DTX,CURVEY,ILP,0)	S3202400
	COORD = CURVEY(ILP) - 8.0	S3202410
	CALL CHARQ(DTX(ILP)+4.0,COORD,0,ICRVT(2),2,2,1)	S3202420
C		S3202430
C	DRAW THE POTENTIAL TEMPERATURE LINE	S3202440
C		S3202450
	CALL PLOTQ(PTX,CURVEY,ILP,1)	S3202460
	COORD = CURVEY(ILP) + 3.0	S3202470
	CALL CHARQ(PTX(ILP),COORD,0,ICRVT(3),2,2,1)	S3202480
C		S3202490
C	DRAW THE WIND DIRECTION LINE	S3202500
C		S3202510
	I1 = 1	S3202520
	DO 90 I=2,ILP	S3202530
	IF(AWDIR(I) .GE. 0.0)GO TO 90	S3202540
	NUMP = I - I1	S3202550
	CALL PLOTQ(WDX(I1),CURVEY(I1),NUMP,0)	S3202560
	I1 = I	S3202570

90	CONTINUE	S3202580
	NUMP = ILP - I1 + 1	S3202590
	CALL PLOTQ(WDX(I1),CURVEY(I1),NUMP,0)	S3202600
	COORD = CURVEY(ILP) - 8.0	S3202610
	CALL CHARQ(WDX(ILP)+4.0,COORD,0,ICRVT(4),2,2,1)	S3202620
C		S3202630
C	DRAW TICK MARKS AT THE VALID DATA POINTS ON THE Y AXIS	S3202640
C		S3202650
	DO 100 I=1,ILP	S3202660
	YL(1) = ALT(I) * 0.08 + 90.0	S3202670
	YL(2) = YL(1)	S3202680
100	CALL PLOTQ(XLINQ,YL,2,0)	S3202690
C		S3202700
C	DRAW ** AT CALCULATION HEIGHT	S3202710
C		S3202720
	COORD=CALHT*0.08+86.0	S3202730
	CALL CHARQ(115.0,COORD,0,STARS,2,2,1)	S3202740
	CALL CHARQ(705.0,COORD,0,STARS,2,2,1)	S3202750
C		S3202760
C	DRAW @ AT STABILIZATION HEIGHT	S3202770
C		S3202780
	CALL CHARQ(616.0,86.5+0.08*H,0,IHAT,1,2,1)	S3202790
C		S3202800
C	DRAW THE CLOUD	S3202810
C		S3202820
110	IF(GOOD.GT.0) CALL CLOUD	S3202830
C		S3202840
C	WRITE OUT LAYER INTERFACE DATA AND PLOT IT	S3202850
C		S3202860
	NLINE=0	S3202870
	IHT(1)=1	S3202880
	IHTX=2	S3202890
	IF(LAYBOT(1).EQ.1) GO TO 120	S3202900
	IHT(2)=LAYBOT(1)	S3202910
	LXWRD=5	S3202920
	NCHAR=40	S3202930
	NXWRD=10	S3202940
	NLINE=1	S3202950
	IHTX=3	S3202960
	ISURT(6)=IBOTV(1)	S3202970
	ISURT(7)=IBOTV(2)	S3202980
	GO TO 130	S3202990
120	NCHAR=32	S3203000
	NXWRD=6	S3203010
	LXWRD=1	S3203020
130	ISURT(NXWRD)=ITOPV(1)	S3203030
	ISURT(NXWRD+1)=ITOPV(2)	S3203040
	IHT(IHTX)=LAYTOP(1)+1	S3203050
	NLINE=NLINE+1	S3203060
	NXWRD=NXWRD+4	S3203070
	IHTX=IHTX+1	S3203080
	IF(LAYTOP(2).GT.0) GO TO 140	S3203090

LXWRD2=0	S3203100
NCHAR=NCHAR-16	S3203110
GO TO 150	S3203120
140 LXWRD2=LXWRD+8	S3203130
ISURT(NXWRD)=IBOTV(1)	S3203140
ISURT(NXWRD+1)=IBOTV(2)	S3203150
ISURT(NXWRD+4)=ITOPV(1)	S3203160
ISURT(NXWRD+5)=ITOPV(2)	S3203170
IHT(IHTX)=LAYBOT(2)	S3203180
IHT(IHTX+1)=LAYTOP(2)+1	S3203190
NLINE=NLINE+2	S3203200
150 IF(GOOD.LT.0) GO TO 180	S3203210
LALAB(LXWRD)=LALAB1(1)	S3203220
LALAB(LXWRD+1)=LALAB1(2)	S3203230
LALAB(LXWRD+2)=LALAB1(3)	S3203240
IF(LXWRD2.GT.0) GO TO 160	S3203250
LCHAR=2*(LXWRD+2)	S3203260
GO TO 170	S3203270
160 LALAB(LXWRD2)=LALAB2(1)	S3203280
LALAB(LXWRD2+1)=LALAB2(2)	S3203290
LALAB(LXWRD2+2)=LALAB2(3)	S3203300
LCHAR=2*(LXWRD2+2)	S3203310
170 CALL CHARQ(198.0+LASET,461.0,0,LALAB,LCHAR,2,1)	S3203320
CALL CHARQ(163.0,451.0,0,ISURT,NCHAR,2,1)	S3203330
180 DO 190 NL=1,NLINE+1	S3203340
XP=100.0+56.0*FLOAT(NL)	S3203350
CALL MOVEM(IHT(NL),XP,NL,NLINE)	S3203360
190 CONTINUE	S3203370
IF(GOOD.GT.0) GO TO 200	S3203380
CALL PLOT(4.50,2.56,3)	S3203390
IF(GOOD.EQ.0)	S3203400
\$ WRITE(ICU,9008) CR,CLRDSP,TAB,CLRTAB,CR,INVHF,OFF	S3203410
9008 FORMAT(5A2,12H * * * * * ,2A2,34HDO NOT CHANGE PLOTTER PEN POSITIS	S3203420
\$ON,2A2,11H * * * * *)	S3203430
RETURN	S3203440
C	S3203450
C PRINT DATE AND TIME PLOTTED .	S3203460
C	S3203470
200 CALL FTIME(IALPHA)	S3203480
CALL CODE(80)	S3203490
READ (IALPHA,9009) (IFRMT(I),I=1,7)	S3203500
9009 FORMAT (A2,1X,A2,11X,A2,2X,A2,A1,3X,2A2)	S3203510
CALL CODE	S3203520
WRITE(IALPHA,9010) (IFRMT(I),I=1,7)	S3203530
9010 FORMAT(16HPLOTTED AT: *** ,2A2,2H, ,A2,1X,4A2,4H ***)	S3203540
CALL CHARQ(499.,7.,0,IALPHA,37,2,1)	S3203550
C	S3203560
C CALL URITE TO TERMINATE GRAPHIC MODE	S3203570
C DELETE "PLOTING" MESSAGE.	S3203580
C	S3203590
CALL URITE	S3203600
WRITE(ICU,9006) CR,CLRLNE,BKAKO	S3203610

C		S3203620
C	TERMINATE RMETM	S3203630
C		S3203640
	RETURN	S3203650
C		S3203660
C	END OF RMETM	S3203670
C		S3203680
	END	S3203690

	SUBROUTINE WINDS(WD,NWD,IST)	S3300000
	. , UPDATE: 8213 SOURCE: 22 JAN 79 LOCATION: KSC	S3300010
C		S3300020
C	-----	S3300030
C	-	S3300040
C	- THIS SUBROUTINE COMPUTES THE WIND DIRECTION LABELS -	S3300050
C	- FOR PLOTTING -	S3300060
C	-	S3300070
C	-----	S3300080
C		S3300090
	DIMENSION DWD(30),STWD(4),WD(1)	S3300100
	DATA STWD/270.0,0.0,90.0,180.0/	S3300110
	WD1=WD(1)	S3300120
	WDX=WD1	S3300130
	WDN=WD1	S3300140
	DO 10 I=2,NWD	S3300150
	WD2=WD(I)	S3300160
C		S3300170
C	CALCULATE LAYER DIRECTIONAL SHEAR	S3300180
C		S3300190
	DWDI=WD2-WD1	S3300200
	IF(DWDI.LT.-180.0) DWDI=DWDI+360.0	S3300210
	IF(DWDI.GT. 180.0) DWDI=DWDI-360.0	S3300220
	DWD(I)=DWDI	S3300230
	WDI=WD(I-1)+DWDI	S3300240
C		S3300250
C	FIND MINIMUM WIND DIRECTION WITH RESPECT TO WD(1)	S3300260
C		S3300270
	IF(WDI.LT.WDN) WDN=WDI	S3300280
	WD(I)=WDI	S3300290
	WD1=WD2	S3300300
10	CONTINUE	S3300310
	WDNP=WDN	S3300320
	IF(WDN.LT.0) WDN=WDN+360.0	S3300330
C		S3300340
C	CALCULATE START INDEX FOR WIND DIRECTION LABEL	S3300350
C		S3300360
	IST=2+IFIX(WDN)/90	S3300370
	IF(IST.GT.4) IST=1	S3300380
C		S3300390
C	CALCULATE RELATIVE POSITION WITH RESPECT TO STWD(IST)	S3300400
C		S3300410
	WD(1)=WD(1)-WDNP+WDN-STWD(IST)	S3300420
	DO 20 I=2,NWD	S3300430
	WD(I)=WD(I-1)+DWD(I)	S3300440
	IF(WD(I).LT.0.0) WD(I)=WD(I)+360.0	S3300450
	IF(WD(I).GT.450.0) WD(I)=WD(I)-360.0	S3300460
20	CONTINUE	S3300470
	RETURN	S3300480
	END	S3300490

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C - - - - - S3400000
C S3400010
C S3400020
C S3400030
C - - - - - S3400040
SUBROUTINE CLOUD
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC S3400050
C S3400060
C S3400070
C ----- S3400080
C - S3400090
C - THIS SUBROUTINE DRAWS THE CLOUD FOR THE MET - S3400100
C - PROFILE, AT A SPECIFIED X AND Y POSITION. - S3400110
C - S3400120
C ----- S3400130
Cc S3400140
C**** B E G I N C O M M O N A R E A ****S3400150
C 04/02/82 S3400160
C-----MATH PARAMETERS AND CONSTANTS S3400170
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S3400180
C-----INPUT OPTIONS S3400190
REAL LAMBDA S3400200
INTEGER FILE,GOOD,TITLE S3400210
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S3400220
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S3400230
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S3400240
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S3400250
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S3400260
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S3400270
. ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S3400280
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S3400290
. FS(20),MDLNAM(12),DBAR(20) S3400300
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S3400310
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S3400320
. MODEL4,MODEL5,MODEL6 S3400330
INTEGER RUNNUM,RT,CL,CS S3400340
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S3400350
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S3400360
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S3400370
. ,MIXING,MAXDEP,LAYBOT(3) S3400380
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S3400390
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S3400400
. MINUS1,MINUS9,MINS1,MINS9, S3400410
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S3400420
. RT(24),TPROPC,IDXRT S3400430
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S3400440
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S3400450
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S3400460
. CLRLNE,INSLNE,DELIN S3400470
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S3400480
. INVNDR(2),ULINE(2), S3400490
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,S3400500

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.          CLRLNE,INSLNE,DELIN,          S3400510
.          IESCAJ(3),NULL,IBLNK,        S3400520
.          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S3400530
C-----VEHICLE PARAMETERS          S3400540
COMMON /VCLPR/ VPAR(17)          S3400550
C-----TIME PARAMETERS          S3400560
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S3400570
.          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2) S3400580
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S3400590
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S3400600
.          RH(30),PTEMP(30),SIGEP(30),SIGAP(30) S3400610
C-----LAYER PARAMETERS          S3400620
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S3400630
.          SIGYO(29) S3400640
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS) S3400650
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6) S3400660
C-----CALCULATED NEW LAYER PARAMETERS S3400670
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S3400680
.          SPEEDN(32) S3400690
C-----CONVERSION FACTORS          S3400700
COMMON /CNVRT/ QCONV(4),QPDEPH S3400710
C          S3400720
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S3400730
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S3400740
C-----READ/WRITE BUFFER          S3400750
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S3400760
C*****S3400770
C          S3400780
C-----EQUIVALENCE STATEMENTS          S3400790
EQUIVALENCE (IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S3400800
.          ,(IPU2,IPAR(4)),(IPU3,IPAR(5)) S3400810
EQUIVALENCE (MAXDEP,GRVSET),(IFRMT(1),IFRMT1) S3400820
C          S3400830
C****          E N D O F C O M M O N A R E A ****S3400840
Cq          S3400850
C          S3400860
DIMENSION RANGE(30,6),BEARNG(30,6),SIGYBR(30,6),CORSG(30,6) S3400870
.          ,RCORSG(6),BCORSG(6),XCORSG(6) S3400880
C-----EQUIVALENCE STATEMENTS          S3400890
EQUIVALENCE          S3400900
.          (PLUS,RANGE),(PLUS(181),BEARNG),(PLUS(361),SIGYBR) S3400910
.          ,(PLUS(541),XCORSG),(PLUS(547),CORSG),(PLUS(727),RCORSG) S3400920
.          ,(PLUS(733),BCORSG) S3400930
DIMENSION X(5),Y(5) S3400940
REAL LEFT S3400950
EQUIVALENCE (X,LEFT),(Y,BOT),(X(3),RIGHT),(Y(2),TOP) S3400960
DATA D2RAD/0.01745329/ S3400970
INDIR=NLAIS+1 S3400980
IF(H.GT.ALT(LAYTOP(1))) INDIR=NLAIS+2 S3400990
BOT=90.0+0.08*ALT(1) S3401000
DO 20 I=1,NLAIS S3401010
XCENR=506.0+0.022*TAUK*SPEEDN(I) S3401020

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BOVRA=SIGPP(I)/SIGLL(I)	S3401030
THETAP=DIRN(INDIR)-DIRN(I)	S3401040
BOVRA1=1.-BOVRA*BOVRA	S3401050
STP=SIN(THETAP*D2RAD)	S3401060
THETAR=ATAN(BOVRA1*STP*COS(THETAP*D2RAD)/(1.-BOVRA1*STP*STP))	S3401070
CTMTP=COS((DIRN(I)-THETAP)*D2RAD)	S3401080
DX=SIGPP(I)*COS(THETAR)/SQRT(1.-BOVRA1*CTMTP*CTMTP)	S3401090
TOP=AMIN1(90.0+0.08*ALT(I+1),378.0)	S3401100
LEFT=AMIN1(AMAX1(XCENTR-0.022*DX,506.0),726.0)	S3401110
RIGHT=AMAX1(AMIN1(XCENTR+0.022*DX,726.0),506.0)	S3401120
IF(LEFT.EQ.RIGHT) GO TO 10	S3401130
X(2)=LEFT	S3401140
Y(3)=TOP	S3401150
X(4)=RIGHT	S3401160
Y(4)=BOT	S3401170
X(5)=LEFT	S3401180
Y(5)=BOT	S3401190
CALL PLOTQ(X,Y,5,0)	S3401200
10 BOT=TOP	S3401210
20 CONTINUE	S3401220
RETURN	S3401230
END	S3401240


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C - - - - - S3500000
C - - - - - S3500010
C - - - - - S3500020
C - - - - - S3500030
C - - - - - S3500040
C - - - - - S3500050
C - - - - - S3500060
C - - - - - S3500070
C - - - - - S3500080
C - - - - - S3500090
C - - - - - S3500100
C - - - - - S3500110
C - - - - - S3500120
C - - - - - S3500130
Cq *****S3500140
C****          B E G I N   C O M M O N   A R E A          S3500150
C      04/02/82 S3500160
C-----MATH PARAMETERS AND CONSTANTS S3500170
C      COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S3500180
C-----INPUT OPTIONS S3500190
C      REAL LAMBDA S3500200
C      INTEGER FILE,GOOD,TITLE S3500210
C      COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S3500220
C                      ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S3500230
C                      XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S3500240
C                      IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S3500250
C                      ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S3500260
C                      ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S3500270
C                      ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S3500280
C                      TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S3500290
C                      FS(20),MDLNAM(12),DBAR(20) S3500300
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S3500310
C      LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S3500320
C                      MODEL4,MODEL5,MODEL6 S3500330
C      INTEGER RUNNUM,RT,CL,CS S3500340
C      COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S3500350
C                      DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S3500360
C                      SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S3500370
C                      ,MIXING,MAXDEP,LAYBOT(3) S3500380
C                      ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S3500390
C                      ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S3500400
C                      MINUS1,MINUS9,MINUS1,MINUS9, S3500410
C                      MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S3500420
C                      RT(24),TPOPC,IDXRT S3500430
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S3500440
C      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S3500450
C                      TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S3500460
C                      CLRLNE,INSLNE,DELNE S3500470
C      COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S3500480
C                      INVNDR(2),ULINE(2), S3500490
C                      TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S3500500
C                      CLRLNE,INSLNE,DELNE,

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      .          IESCAJ(3),NULL,IBLNK,
      .          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
C-----VEHICLE PARAMETERS
      COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
      .          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
      .          RH(30),PTMP(30),SIGEP(30),SIGAP(30)
C-----LAYER PARAMETERS
      COMMON /LAYER/ DX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
      .          SIGYO(29)
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
      .          SPEEDN(32)
C-----CONVERSION FACTORS
      COMMON /CNVRT/ QCONV(4),QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
      COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C
C-----EQUIVALENCE STATEMENTS
      EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))
      .          ,(IPU2,IPAR(4)),(IPU3,IPAR(5))
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)
C
C****          E N D   O F   C O M M O N   A R E A
Cç
C
      DIMENSION RANGE(30,6),BEARNG(30,6),SIGYBR(30,6),CORSG(30,6)
      .          ,RCORSG(6),BCORSG(6),XCORSG(6)
C-----EQUIVALENCE STATEMENTS
      EQUIVALENCE
      .          (PLUS,RANGE),(PLUS(181),BEARNG),(PLUS(361),SIGYBR)
      .          ,(PLUS(541),XCORSG),(PLUS(547),CORSG),(PLUS(727),RCORSG)
      .          ,(PLUS(733),BCORSG)
9001 FORMAT (F8.1)
      DIMENSION LAB(1),X(2),Y(2),JNDVAR(4,5),IPSURX(4)
      .          ,ISURX(99),SURX(57)
      EQUIVALENCE (JNDVR1,JNDVAR(1,2)),(JNDVR2,JNDVAR(1,3))
      .          ,(JNDVR3,JNDVAR(1,4)),(JNDVR4,JNDVAR(1,5))
      .          ,(JNDVR0,JNDVAR(1,1))
      DATA IPSURX/44,17,4,1/
      DATA SURX/130.,150.,160.,170.,180.,190.,200.,210.,220.,230.
      .          ,240.,250.,260.,270.,280.,290.,300.,310.,320.,330.
      .          ,340.,350.,360.,370.,380.,390.,400.,410.,420.,430.

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.	,440.,450.,460.,470.,480.,490.,500.,510.,520.,530.	S3501030
.	,540.,550.,560.,570.,580.,590.,600.,610.,620.,630.	S3501040
.	,640.,650.,660.,670.,680.,690.,700./	S3501050
	DATA ISURX/1,1,55,6,1,8,10,17,19,26,28,35,37,44,46,55	S3501060
.	,12,1,4,5,8,10,13,14,17,19,22,23,26,28,31,32,35	S3501070
.	,37,40,44,45,47,48,51,55	S3501080
.	,28,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18	S3501090
.	,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36	S3501100
.	,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54	S3501110
.	,54,55,56/	S3501120
	IF(JND.EQ.1) GO TO 30	S3501130
	Y(1) = ALT(JND) * 0.08 + 90.0	S3501140
	IF (ALT(JND) .GE. 3600.0) GO TO 30	S3501150
	Y(2) = Y(1)	S3501160
	IST=IPSURX(3+NL-NLINE)	S3501170
	NDASH=ISURX(IST)	S3501180
	NINC=1	S3501190
	IF(GOOD.GT.0) GO TO 10	S3501200
	NDASH=28	S3501210
	IST=44	S3501220
	NINC=7	S3501230
10	DO 20 ND=1,NDASH,NINC	S3501240
	ND2=2*ND	S3501250
	ND2M1=ND2-1	S3501260
	X(1)=SURX(ISURX(IST+ND2M1))	S3501270
	X(2)=SURX(ISURX(IST+ND2))	S3501280
	CALL PLOTQ(X,Y,2,0)	S3501290
20	CONTINUE	S3501300
30	IF((GOOD.GT.0.AND.JND.GT.1).OR.(GOOD.EQ.0.AND.JND.EQ.1)) GO TO 40	S3501310
	RETURN	S3501320
40	CALL CODE	S3501330
	WRITE (JNDVR0,9001) ALT(JND)	S3501340
	YLABEL=TEMP(JND)-273.15	S3501350
	CALL CODE	S3501360
	WRITE (JNDVR1,9001) YLABEL	S3501370
	YLABEL = PTEMP(JND) - 273.15	S3501380
	CALL CODE	S3501390
	WRITE (JNDVR2,9001) YLABEL	S3501400
	CALL CODE	S3501410
	WRITE (JNDVR3,9001) SPEED(JND)	S3501420
	CALL CODE	S3501430
	WRITE (JNDVR4,9001) DIR(JND)	S3501440
	YLABEL = 435.0	S3501450
	DO 50 I=1,5	S3501460
	CALL CHARQ(XPR,YLABEL,0,JNDVAR(1,I),8,2,1)	S3501470
50	YLABEL = YLABEL - 10.0	S3501480
	RETURN	S3501490
	END	S3501500

C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S3600000
C																		S3600010
C																		S3600020
C																		S3600030
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S3600040
																		S3600050
																		S3600060
																		S3600070
																		S3600080
																		S3600090
																		S3600100
																		S3600110
																		S3600120
																		S3600130
																		S3600140
																		S3600150
																		S3600160
																		S3600170
																		S3600180
10																		S3600190
																		S3600200
																		S3600210
																		S3600220

	SUBROUTINE PLOTQ(X,Y,LEN,JSW)	S3700000
	, , UPDATE: 8213 SOURCE: 16 DEC 81 LOCATION: KSC	S3700010
	DIMENSION X(1),Y(1)	S3700020
C	PLOTS SOLID OR DASHED LINES	S3700030
C		S3700040
C		S3700050
	LSW = 3	S3700060
	DO 70 J=1,LEN	S3700070
	XP = X(J)*.01	S3700080
	YP = Y(J)*.01	S3700090
	IF (JSW .EQ. 0) GO TO 10	S3700100
	IF (LSW .EQ. 2) GO TO 20	S3700110
	DLST = 0.0	S3700120
	XLST = XP	S3700130
	YLST = YP	S3700140
	LST = 1	S3700150
	L = 2	S3700160
	10 CALL PLOT(XP,YP,LSW)	S3700170
	GO TO 70	S3700180
	20 DX = XP-XLST	S3700190
	DY = YP-YLST	S3700200
	DR = SQRT(DX*DX+DY*DY)	S3700210
	TH = ATAN2(DY,DX)	S3700220
	CSS = COS(TH)	S3700230
	SSS = SIN(TH)	S3700240
	30 DINC = .05	S3700250
	40 DINC = DINC-DLST	S3700260
	IF (DINC .LE. DR) GO TO 50	S3700270
	DINC = DR	S3700280
	DLST = DLST+DINC	S3700290
	GO TO 60	S3700300
	50 DLST = 0.0	S3700310
	60 XN = XLST+DINC*CSS	S3700320
	YN = YLST+DINC*SSS	S3700330
	LTSW = 2	S3700340
	IF (MOD(LST,2) .EQ. 0) LTSW = 3	S3700350
	CALL PLOT(XN,YN,LTSW)	S3700360
	XLST = XN	S3700370
	YLST = YN	S3700380
	DR = DR-DINC	S3700390
	IF (DLST .GT. 0.0) GO TO 70	S3700400
	LST = LST+1	S3700410
	IF (LST .GT. L) LST = 1	S3700420
	IF (DR .GT. 0.0) GO TO 30	S3700430
	70 LSW = 2	S3700440
	CALL PLOT(.01*X(LEN),.01*Y(LEN),3)	S3700450
	RETURN	S3700460
	END	S3700470

REEDM SOURCE MODULE &RDHMM

FTN4	S3800000
PROGRAM RDHMM(5)	S3800010
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S3800020
C::	S3800030
C::	S3800040
C:::	S3800050
C:::	S3800060
C::: ORGANIZATION: H. E. CRAMER CO., INC.	S3800070
C:::	S3800080
C::: WORK FOR: DR. J. B. STEPHENS (ES84)	S3800090
C:::	S3800100
C::: PROGRAM CODE: RDHMM	S3800110
C:::	S3800120
C::: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST	S3800130
C::: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER):	S3800140
C:::	S3800150
C::: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS	S3800160
C:::	S3800170
C::: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS	S3800180
C:::	S3800190
C::	S3800200
C::	S3800210
C *****	S3800220
C *	S3800230
C * PROGRAM RDHMM - READS BOTTOM AND MIXING LAYER HEIGHT *	S3800240
C *	S3800250
C *****	S3800260
Cc	S3800270
C**** BEGIN COMMON AREA *****	S3800280
C 04/02/82	S3800290
C-----MATH PARAMETERS AND CONSTANTS	S3800300
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S3800310
C-----INPUT OPTIONS	S3800320
REAL LAMBDA	S3800330
INTEGER FILE,GOOD,TITLE	S3800340
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S3800350
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S3800360
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S3800370
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S3800380
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S3800390
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S3800400
. ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S3800410
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S3800420
. FS(20),MDLNAM(12),DBAR(20)	S3800430
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S3800440
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S3800450
. MODEL4,MODEL5,MODEL6	S3800460
INTEGER RUNNUM,RT,CL,CS	S3800470
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S3800480
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S3800490

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      SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP          S3800500
      ,MIXING,MAXDEP,LAYBOT(3)                    S3800510
      ,ALTSV,BATCH,CL(14),CS(10),CASSET,IAGAIN,    S3800520
      ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),   S3800530
      MINUS1,MINUS9,MIN51,MIN59,                  S3800540
      MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S3800550
      RT(24),TPROPC,IDXRT                          S3800560
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S3800570
      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,   S3800580
      TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S3800590
      CLRLNE,INSLNE,DELIN E                        S3800600
      COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKN G(2),INV(2),INVHF(2), S3800610
      INVNDR(2),ULINE(2),                          S3800620
      TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S3800630
      CLRLNE,INSLNE,DELIN E                        S3800640
      IESCAJ(3),NULL,IBLNK, .                      S3800650
      IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)     S3800660
C-----VEHICLE PARAMETERS                               S3800670
      COMMON /VCLPR/ VPAR(17)                      S3800680
C-----TIME PARAMETERS                               S3800690
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S3800700
      LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)  S3800710
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S3800720
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S3800730
      RH(30),PTEMP(30),SIGEP(30),SIGAP(30)         S3800740
C-----LAYER PARAMETERS                               S3800750
      COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S3800760
      SIGYO(29)                                     S3800770
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)     S3800780
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)    S3800790
C-----CALCULATED NEW LAYER PARAMETERS                S3800800
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S3800810
      SPEEDN(32)                                    S3800820
C-----CONVERSION FACTORS                             S3800830
      COMMON /CNVRT/ QCONV(4),QPDEPH               S3800840
C                                                    S3800850
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S3800860
      COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S3800870
C-----READ/WRITE BUFFER                             S3800880
C-----A R R A Y   = 2077 + 1 + 1 + 2 * 900 = 3879S3800890
C*****S3800900
C                                                    S3800910
C-----EQUIVALENCE STATEMENTS                         S3800920
      EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S3800930
      ,(IPU2,IPAR(4)),(IPU3,IPAR(5))              S3800940
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1) S3800950
C                                                    S3800960
C****          E N D   O F   C O M M O N   A R E A      ****S3800970
Cq                                                    S3800980
CF-----INPUT FORMAT STATEMENTS                      S3800990
      9001 FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS3801000
      * IF -1 TYPED AGAIN/)                        S3801010

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9002	FORMAT(A2)	S3801020
9003	FORMAT(I2)	S3801030
9004	FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REF.	S3801040
	*,I2,1H.,I1/)	S3801050
9005	FORMAT(50H DO YOU WISH TO PLOT THE METEOROLOGICAL PROFILE? (,2A2,	S3801060
	*1HY,2A2,2HES,2A2,1H.,,2A2,1HN,2A2,4HO):_)	S3801070
9006	FORMAT(3A2)	S3801080
9007	FORMAT(15H HEIGHT AT THE ,2A2,8H OF THE ,3A2,15HLAYER (METERS):,9XS	S3801090
	*,F8.2)	S3801100
9008	FORMAT(24H DO YOU WISH TO CHANGE (,2A2,1HN,2A2,6HEITHER,2A2,1H.,,	S3801110
	*2A2,1HU,2A2,5HPPER,,2A2,1HL,2A2,25HOWER) TRANSITION LAYER?:_)	S3801120
9009	FORMAT(24H DO YOU WISH TO CHANGE (,2A2,1HT,2A2,2HOP,2A2,1H.,,2A2,	S3801130
	*1HB,2A2,33HASE) HEIGHT OF THE UPPER LAYER?:_)	S3801140
9010	FORMAT(25H ENTER THE HEIGHT AT THE ,2A2,8H OF THE ,3A2,17H LAYER (S3801150	
	*METERS):_)	S3801160
9011	FORMAT(69H *** REEDM WARNING 020, INVALID LAYERING - SPACE RETURN	S3801170
	*TO CONTINUE:_)	S3801180
9012	FORMAT(2A2,18H ENTER SIGMA AZ, (,2A2,1HE,2A2,9HSTIMATED=,2A2,	S3801190
	*F5.2,2A2,1H.,,2A2,1HA,2A2,9HNOTHER):_)	S3801200
9013	FORMAT(2A2,23H ENTER SIGMA AZ (DEG):_)	S3801210
9014	FORMAT(2A2,20H SIGMA AZ (DEGREES):,45X,F5.2)	S3801220
9015	FORMAT(57H DO YOU WISH TO INPUT SIGMA A & SIGMA E FOR EACH LEVEL?	S3801230
	*(,2A2,1HN,2A2,1HO,2A2,1H.,,2A2,1HY,2A2,5HES):_)	S3801240
9016	FORMAT(18H ENTER SIGMA EL, (,2A2,1HE,2A2,9HSTIMATED=,2A2,F5.2	S3801250
	*,2A2,1H.,,2A2,1HA,2A2,9HNOTHER):_)	S3801260
9017	FORMAT(2A2,23H ENTER SIGMA EL (DEG):_)	S3801270
9018	FORMAT(2A2,20H SIGMA EL (DEGREES):,45X,F5.2)	S3801280
9019	FORMAT(43H ENTER SIGMA A, SIGMA E (IN DEG) FOR LEVEL ,I2,2H (,	S3801290
	*F6.3,1H.,F6.3,3H):_)	S3801300
9020	FORMAT(2A2,27H SIGMA A,SIGMA E FOR LEVEL ,I2,1H:,33X,2F6.2)	S3801310
9021	FORMAT(69H *** REEDM WARNING 021, TOP OF UPPER LAYER LESS THAN TOPS	S3801320
	* OF SOUNDING,/12H CONTINUE? (,2A2,1HN,2A2,1HO,2A2,1H.,,2A2,1HY,2A2,	S3801330
	*5HES):_)	S3801340
9022	FORMAT(68H *** REEDM WARNING 022, GAP BETWEEN LAYERS MAY NOT PRODUS	S3801350
	*CE REALISTIC/44H GRAVITATIONAL SETTLING RESULTS, CONTINUE? (,2A2,	S3801360
	*1HN,2A2,1HO,2A2,1H.,,2A2,1HY,2A2,5HES):_)	S3801370
CF-----	OUTPUT FORMAT STATEMENTS.	S3801380
9023	FORMAT(2A2,A1)	S3801390
C-----	TYPE AND DIMENSION STATEMENTS	S3801400
	LOGICAL IBATCH,DONE(2)	S3801410
	INTEGER UPPER(3),LOWER(3),BASE(2),TOP(2),FMTHT1(25),FMTHT2(25)	S3801420
	DIMENSION HEIGHT(2),IPFMT(2)	S3801430
C-----		S3801440
	EQUIVALENCE (PLUS(740),IBATCH), (PLUS(738),HEIGHT),	S3801450
1	(PLUS(737),IPFMT), (PLUS(736),IIUTMP),	S3801460
2	(PLUS(735),LOOP), (PLUS(734),IPLOT)	S3801470
C-----	DATA STATEMENTS	S3801480
	DATA FMTHT1 /2H(8,2H(2,2HH ,2H+),2H," ,2H C,2HAL,2HCU,2HLA,2HTI,	S3801490
1	2HON,2H H,2HEI,2HGH,2HT",2H,7,2H(2,2HH ,2H+),2H,8,	S3801500
2	2HX,,2HF8,2H.2,2H) ,2H /	S3801510
	DATA FMTHT2 /2H(7,2H(2,2HH ,2H+),2H," ,2H S,2HTA,2HBI,2HLI,2HZA,	S3801520
1	2HTI,2HON,2H H,2HEI,2HGH,2HT",2H,7,2H(2,2HH ,2H+),	S3801530

2	2H,8,2HX,,2HF8,2H.2,2H) /	S3801540
	DATA UPPER/2HUP,2HPE,1HR/	S3801550
	DATA LOWER/2HLO,2HWE,1HR/	S3801560
	DATA BASE/2HBA,2HSE/	S3801570
	DATA TOP/2HTO,2HP /	S3801580
	DATA IHF/1HF/,IHU/1HU/,IHL/1HL/,IHB/1HB/,IHT/1HT/,IHA/1HA/,	S3801590
	*IHE/1HE/	S3801600
	DATA IIHAN/2HAN/,IIHES/2HES/,IIHNE/2HNE/	S3801610
	DATA IESA/15501B/,IESD/15504B/,IESJ/15512B/	S3801620
	DATA JVERSN/8213/	S3801630
C		S3801640
C		S3801650
	IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S3801660
	IF (CRT) GO TO 10	S3801670
	IESA = NULL	S3801680
	IESD = NULL	S3801690
	IESJ = .NULL	S3801700
	10 CONTINUE	S3801710
C		S3801720
C-----	-----DETERMINE SEGMENT ENTRY POINT.	S3801730
	GOTO (20,130,460), NNNTRY	S3801740
	20 CONTINUE	S3801750
	IBATCH = .FALSE.	S3801760
C		S3801770
	IF(KEEP.EQ.1) GO TO 40	S3801780
C-----	-----BEGIN PROCESSING	S3801790
	IF(ICALC.EQ.1) CALHT=0.0	S3801800
	IF(ICALC.EQ.2) CALHT=H	S3801810
C	DEFAULT MIXING HEIGHT TO TWICE THE STABILIZATION HEIGHT.	S3801820
	HM(1) = H + H	S3801830
	ISF=1	S3801840
	INDX=IHIDX(ALT,NUM,HM(1),ISF)	S3801850
	HM(1)=ALT(INDX+1)	S3801860
	HM(2)=0.0	S3801870
	BOTLAY=0.0	S3801880
	LAYBOT(1)=1	S3801890
	LAYTOP(1)=INDX	S3801900
	LAYBOT(2)= 1	S3801910
	LAYTOP(2)= 0	S3801920
	LAYBOT(3) = 1	S3801930
	LAYTOP(3) = 0	S3801940
	IF(INDX+1 .EQ. NUM) GOTO 40	S3801950
C-----	-----FOR HM(1) \$ ALT(NUM) SET TOP OF SECOND	S3801960
C	BOUNDARY LAYER TO TOP OF MET SOUNDING.	S3801970
	HM(2) = ALT(NUM)	S3801980
	LAYTOP(2) = NUM - 1	S3801990
	IF(MODEL .NE. 6) GOTO 30	S3802000
	LAYBOT(2) = 1	S3802010
	GOTO 40	S3802020
	30 LAYBOT(2) = INDX + 1	S3802030
	BOTLAY = HM(1)	S3802040
	40 CONTINUE	S3802050

C-----	INITIALIZE CALCULATION & STABILIZATION RELATIONSHIPS.	S3802060
	HEIGHT(1) = CALHT	S3802070
	HEIGHT(2) = H	S3802080
	IF(H .GT. CALHT) GOTO 50	S3802090
	IPFMT(1) = 1	S3802100
	IPFMT(2) = 2	S3802110
	GOTO 60	S3802120
50	IPFMT(1) = 2	S3802130
	IPFMT(2) = 1	S3802140
60	CONTINUE	S3802150
	JER = 0	S3802160
C-----	PLOT METEOROLOGICAL PROFILE	S3802170
	IPLOT=1	S3802180
	GOOD=0	S3802190
	IF(.NOT.BATCH) GOTO 70	S3802200
	READ(IIU,9002) INPT	S3802210
	IPLOT = 2	S3802220
	IF(INPT .EQ. INJ .OR. INPT .EQ. INOJ) GOTO 130	S3802230
	IPLOT = 1	S3802240
	N = 2	S3802250
	IF(INPT .EQ. IHF) N = 1	S3802260
	GOTO 120	S3802270
70	WRITE(ICU,9005) INVNDR,INV,OFF,ULINE,OFF	S3802280
	INPT = IBLNK	S3802290
	READ(IIU,9002) INPT	S3802300
	N = 1	S3802310
	IF(INPT.EQ.INJ .OR. INPT.EQ.INOJ) GO TO 90	S3802320
	IF(INPT .EQ. MINUS9) GO TO 900	S3802330
	IF(INPT .NE. MINUS1) GO TO 80	S3802340
	JER = JER+1	S3802350
	IF (JER .GT. 1) GO TO 890	S3802360
	WRITE (ICU,9001)	S3802370
	GO TO 70	S3802380
80	IF (INPT .EQ. IBLNK. OR. INPT.EQ. IYSJ. OR. INPT.EQ. IYESJ) GO TO 100	S3802390
	WRITE (ICU,9004) INV,OFF,17,0	S3802400
	GO TO 70	S3802410
90	IPLOT = 2	S3802420
100	JER = 0	S3802430
	WRITE(ICU,9006) IESA,IESD,IESJ	S3802440
110	GO TO (120,130) IPLOT	S3802450
120	GOOD=0	S3802460
	NNNEST = 4	S3802470
	NNNTRY = N	S3802480
	LLNEST = 3	S3802490
	LLNTRY = 2	S3802500
	CALL REEDM	S3802510
C-----	DISPLAY BOUNDARY LAYERS VALUES. MUCH OF THE LOGIC DETERMINES	S3802520
C	WHEN TO DISPLAY THE CALCULATION & STABILIZATION HEIGHTS.	S3802530
C		S3802540
130	CONTINUE	S3802550
	IF(.NOT.BATCH .OR. IBATCH) GOTO 150	S3802560
	READ(IIU,9002) I	S3802570

	IF(I .EQ. IYSJ.OR. I .EQ.IYESJ) GOTO 140	S3802580
	GO TO 460	S3802590
C	GOTO (450,460), IPLOT	S3802600
140	IBATCH = .TRUE.	S3802610
	IIUTMP = IIU	S3802620
	IIU = ICU	S3802630
150	DONE(1) = .FALSE.	S3802640
	DONE(2) = .FALSE.	S3802650
	LOOP=0	S3802660
	DO 160 I = 1,2	S3802670
	I1 = IPFMT(I)	S3802680
	IF(HM(2).EQ.0.0.OR.HEIGHT(I1).LT.HM(2)) GO TO 160	S3802690
	IF(I1.EQ.1) WRITE(ICU,FMTHT1) HEIGHT(1)	S3802700
	IF(I1.EQ.2) WRITE(ICU,FMTHT2) HEIGHT(2)	S3802710
	LOOP=LOOP+1	S3802720
	DONE(I1) = .TRUE.	S3802730
160	CONTINUE	S3802740
	IF(HM(2).EQ.0.0) GO TO 170	S3802750
	WRITE(ICU,9007) TOP,UPPER,HM(2)	S3802760
	LOOP=LOOP+1	S3802770
170	DO 180 I = 1,2	S3802780
	I1 = IPFMT(I)	S3802790
	IF(BOTLAY.EQ.0.0.OR.HEIGHT(I1).LT.BOTLAY.OR.DONE(I1)) GO TO 180	S3802800
	IF(I1.EQ.1) WRITE(ICU,FMTHT1) HEIGHT(1)	S3802810
	IF(I1.EQ.2) WRITE(ICU,FMTHT2) HEIGHT(2)	S3802820
	LOOP=LOOP+1	S3802830
	DONE(I1) = .TRUE.	S3802840
180	CONTINUE	S3802850
	IF((MODEL .NE. 6 .AND. BOTLAY .EQ. 0.0) .OR.	S3802860
1	(MODEL .EQ. 6 .AND. HM(2) .EQ. 0.0)) GOTO 190	S3802870
	WRITE(ICU,9007) BASE,UPPER,BOTLAY	S3802880
	LOOP=LOOP+1	S3802890
190	DO 200 I = 1,2	S3802900
	I1 = IPFMT(I)	S3802910
	IF(HEIGHT(I1).LT.HM(1).OR.DONE(I1)) GO TO 200	S3802920
	IF(I1.EQ.1) WRITE(ICU,FMTHT1) HEIGHT(1)	S3802930
	IF(I1.EQ.2) WRITE(ICU,FMTHT2) HEIGHT(2)	S3802940
	LOOP=LOOP+1	S3802950
	DONE(I1) = .TRUE.	S3802960
200	CONTINUE	S3802970
	WRITE(ICU,9007) TOP,LOWER,HM(1)	S3802980
	LOOP=LOOP+1	S3802990
	DO 210 I = 1,2	S3803000
	I1 = IPFMT(I)	S3803010
	IF(DONE(I1)) GO TO 210	S3803020
	IF(I1.EQ.1) WRITE(ICU,FMTHT1) HEIGHT(1)	S3803030
	IF(I1.EQ.2) WRITE(ICU,FMTHT2) HEIGHT(2)	S3803040
	LOOP=LOOP+1	S3803050
	DONE(I1) = .TRUE.	S3803060
210	CONTINUE	S3803070
	WRITE(ICU,9007) BASE,LOWER,ALT(1)	S3803080
	LOOP=LOOP+1	S3803090

C		S3803100
C-----	ENTER BOUNDARY LAYERS OPTIONS.	S3803110
C		S3803120
220	WRITE(ICU,9008) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF	S3803130
	LOOP=LOOP+1	S3803140
	INPT = IBLNK	S3803150
	READ(IIU,9002) INPT	S3803160
	IF(INPT .NE. MINUS1) GOTO 230	S3803170
	INPT = -2	S3803180
	GOTO 420	S3803190
230	IF(.NOT.BATCH .AND. INPT.EQ.MINUS9) GO TO 900	S3803200
	IF (INPT.EQ.IBLNK.OR.INPT.EQ.INJ.OR.INPT.EQ.IIHNE) GO TO 460	S3803210
	IF (INPT .EQ. IHU.OR.INPT .EQ. UPPER(1)) GO TO 240	S3803220
	IF (INPT .EQ. IHL.OR.INPT .EQ. LOWER(1)) GO TO 270	S3803230
	IF (BATCH) GO TO 460	S3803240
	WRITE (ICU,9004) INV,OFF,18,0	S3803250
	LOOP = LOOP-1	S3803260
	GO TO 220	S3803270
240	I = 3	S3803280
	IF(MODEL .EQ. 6) GOTO 280	S3803290
250	WRITE(ICU,9009) INVNDR,INV,OFF,ULINE,OFF	S3803300
	LOOP=LOOP+1	S3803310
	INPT = IBLNK	S3803320
	READ(IIU,9002) INPT	S3803330
	IF(INPT .EQ. MINUS1) GOTO 410	S3803340
	IF(.NOT.BATCH .AND. INPT.EQ.MINUS9) GO TO 900	S3803350
	IF(INPT.EQ.IHB.OR.INPT .EQ.BASE(1)) GO TO 260	S3803360
	IF (INPT.EQ.IBLNK.OR.INPT.EQ.IHT.OR.INPT.EQ.TOP(1)) GO TO 280	S3803370
	WRITE (ICU,9004) INV,OFF,18,2	S3803380
	LOOP = LOOP-1	S3803390
	GO TO 250	S3803400
260	I = 2	S3803410
	GO TO 280	S3803420
270	I=1	S3803430
280	GO TO (290,330,370) I	S3803440
290	WRITE(ICU,9010) TOP,LOWER	S3803450
	LOOP=LOOP+1	S3803460
	CALL IFNBR(IFRMT,14,IER,IIU)	S3803470
	IF (BATCH .OR. IER .EQ. 0) GO TO 310	S3803480
300	WRITE (ICU,9004) INV,OFF,18,1	S3803490
	LOOP = LOOP-1	S3803500
	GO TO 280	S3803510
310	A1 = 0.0	S3803520
	CALL CODE(80)	S3803530
	READ (IFRMT,*) A1	S3803540
	IF(BATCH .AND. A1 .LT. -1.0) A1 = -1.0	S3803550
	IF (A1 .EQ. MINS1) GO TO 410	S3803560
	IF (A1 .EQ. MINS9) GO TO 900	S3803570
	IF (A1 .GE. 0.0) GO TO 320	S3803580
	GO TO 300	S3803590
320	ISF=1	S3803600
	INDX=IHIDX(ALT,NUM,A1,ISF)	S3803610

HM(1)=ALT(INDX+1)	S3803620
LAYTOP(1)=INDX	S3803630
GO TO 420	S3803640
C ENTER BOTLAY - BASE OF UPPER LAYER.	S3803650
330 WRITE(ICU,9010) BASE,UPPER	S3803660
LOOP=LOOP+1	S3803670
CALL IFNBR(IFRMT,14,IER,IIU)	S3803680
IF (BATCH .OR. IER .EQ. 0) GO TO 350	S3803690
340 WRITE (ICU,9004) INV,OFF,18,3	S3803700
LOOP = LOOP-1	S3803710
GO TO 280	S3803720
350 A1 = 0.0	S3803730
CALL CODE(80)	S3803740
READ (IFRMT,*) A1	S3803750
IF(BATCH .AND. A1 .LT. -1.0) A1 = -1.0	S3803760
IF (A1 .EQ. MINS1) GO TO 410	S3803770
IF (A1 .EQ. MINS9) GO TO 900	S3803780
IF (A1 .GE. 0.0) GO TO 360	S3803790
GO TO 340	S3803800
360 ISF=0	S3803810
INDX=IHIDX(ALT,NUM,A1,ISF)	S3803820
BOTLAY=ALT(INDX)	S3803830
LAYBOT(2)=INDX	S3803840
GO TO 420	S3803850
370 WRITE(ICU,9010) TOP,UPPER	S3803860
LOOP=LOOP+1	S3803870
CALL IFNBR(IFRMT,14,IER,IIU)	S3803880
IF (BATCH .OR. IER .EQ. 0) GO TO 390	S3803890
380 WRITE (ICU,9004) INV,OFF,18,4	S3803900
LOOP = LOOP-1	S3803910
GO TO 280	S3803920
390 A1 = 0.0	S3803930
CALL CODE(80)	S3803940
READ (IFRMT,*) A1	S3803950
IF(BATCH .AND. A1 .LT. -1.0) A1 = -1.0	S3803960
IF (A1 .EQ. MINS1) GO TO 410	S3803970
IF (A1 .EQ. MINS9) GO TO 900	S3803980
IF (A1 .GE. 0.0) GO TO 400	S3803990
GO TO 380	S3804000
400 ISF=1	S3804010
INDX=IHIDX(ALT,NUM,A1,ISF)	S3804020
HM(2)=ALT(INDX+1)	S3804030
LAYTOP(2)=INDX	S3804040
GOTO 420	S3804050
410 INPT = MINS1	S3804060
420 DO 430 I=1,LOOP	S3804070
WRITE(ICU,9006) IESA,IESD,IESJ	S3804080
430 CONTINUE	S3804090
IF(BATCH .AND. INPT .LT. -1) INPT = -1	S3804100
IF(INPT+1) 40,130,440	S3804110
440 GO TO (450,130) IPLOT	S3804120
450 GOOD=-1	S3804130

NNNEST = 4	S3804140
NNNTRY = 2	S3804150
LLNEST = 3	S3804160
LLNTRY = 2	S3804170
CALL REEDM	S3804180
460 I=0	S3804190
IF(MODEL .NE. 6) GOTO 490	S3804200
IF(HM(2) .EQ. 0.0 .AND. HM(1) .GT. 0.0) I = 1	S3804210
IF(HM(2).GT.0.0 .AND. HM(2).GT.HM(1) .AND. HM(1).GT.0.0) I = 2	S3804220
IF(I) 550,550,470	S3804230
470 IF(LAYTOP(I)-(NUM-1)) 480,570,570	S3804240
480 WRITE(ICU,9021) INVNDR,INV,OFF,ULINE,OFF	S3804250
INPT = IBLNK	S3804260
READ(IIU,9002) INPT	S3804270
IF(.NOT.BATCH .AND. INPT .EQ. MINUS9) GOTO 900	S3804280
WRITE(ICU,9023) IESCAJ	S3804290
IF(INPT .EQ. IYSJ.OR. INPT .EQ.IYESJ) GOTO 570	S3804300
IF (INPT.EQ.IBLNK.OR.INPT.EQ.INJ.OR.INPT.EQ.INOJ) GO TO 420	S3804310
WRITE (ICU,9004) INV,OFF,0,0	S3804320
GO TO 480	S3804330
490 CONTINUE	S3804340
IF(HM(2).EQ.0.0.AND.BOTLAY.EQ.0.0.AND.HM(1).GT.0.0) I=1	S3804350
IF(HM(2).GT.BOTLAY.AND.BOTLAY.EQ.HM(1).AND.HM(1).GT.0.0) I=2	S3804360
IF(HM(2).GT.BOTLAY.AND.BOTLAY.GT.HM(1).AND.HM(1).GT.0.0) I=3	S3804370
IF(MODEL .EQ. 5) GOTO 540	S3804380
IF(I.EQ.1.AND.CALHT.LT.HM(1)) GO TO 560	S3804390
IF(I.EQ.2.AND.CALHT.LT.HM(2)) GO TO 560	S3804400
IF(I-3) 550,500,550	S3804410
500 IF(CALHT.LT.HM(2).AND.CALHT.GE.BOTLAY) GO TO 510	S3804420
IF(CALHT.LT.HM(1)) GO TO 510	S3804430
GOTO 550	S3804440
510 DO 520 J = 1,4	S3804450
IF(IPLNT(J)-4) 520,530,520	S3804460
520 CONTINUE	S3804470
GOTO 560	S3804480
530 WRITE(ICU,9022) INVNDR,INV,OFF,ULINE,OFF	S3804490
INPT = IBLNK	S3804500
READ(IIU,9002) INPT	S3804510
IF(.NOT.BATCH .AND. INPT .EQ. MINUS9) GOTO 900	S3804520
WRITE(ICU,9023) IESCAJ,IESCAJ	S3804530
IF(INPT .EQ. IYSJ.OR. INPT .EQ.IYESJ) GOTO 560	S3804540
IF (INPT.EQ.IBLNK.OR.INPT.EQ.INJ.OR.IBLNK.EQ.INOJ) GO TO 420	S3804550
WRITE (ICU,9004) INV,OFF,0,0	S3804560
GO TO 530	S3804570
540 IF(I .EQ. 1 .OR. I .EQ. 2) GOTO 560	S3804580
C-----INVALID LAYERING - REENTER LAYERS.	S3804590
550 WRITE (ICU,9011)	S3804600
LOOP=LOOP+1	S3804610
INPT = IBLNK	S3804620
READ(IIU,9002) INPT	S3804630
IF(.NOT.BATCH .AND. INPT .EQ. MINUS9) GOTO 890	S3804640
GO TO 420	S3804650

560 IF(.NOT.MAXDEP.OR.MODEL.NE.4.OR.LAYTOP(1)+1.EQ.NUM) GOTO 570	S3804660
C-----SETUP "HIDDEN" BOUNDARY LAYER FOR MODEL 4	S3804670
C GRAVITATIONAL SETTILING.	S3804680
IF(CALHT.LT.HM(1)) NBK = 2	S3804690
IF(I.NE.1.AND.CALHT.GE.HM(1).AND.LAYTOP(2).NE.NUM) NBK = 3	S3804700
LAYBOT(NBK) = LAYBOT(NBK-1)	S3804710
LAYTOP(NBK) = NUM - 1	S3804720
GOTO 580	S3804730
C-----VALID LAYERING - CONTINUE	S3804740
570 CONTINUE	S3804750
NBK=1	S3804760
IF(I.EQ.2.OR.I.EQ.3) NBK=2	S3804770
580 CONTINUE	S3804780
IF(IPLOT.EQ.1) GOOD = 1	S3804790
IF(IBATCH) IIU = IIUTMP	S3804800
IBATCH = .FALSE.	S3804810
C	S3804820
C-----ENTER SIGMA(A) AND SIGMA(E)	S3804830
C	S3804840
IF(.NOT.BATCH) GOTO 590	S3804850
READ(IIU,9002) I	S3804860
IF(I.NE.IHA.AND.I.NE.IIHAN) GOTO 670	S3804870
IBATCH = .TRUE.	S3804880
IIUTMP = IIU	S3804890
IIU = ICU	S3804900
590 WRITE(ICU,9012) IESA,IESJ,ULINE,OFF,INV,SIGMAR,OFF,ULINE,OFF	S3804910
INPT = IBLNK	S3804920
READ(IIU,9002) INPT	S3804930
IF(BATCH) GOTO 600	S3804940
IF(INPT.EQ.MINUS9) GOTO 900	S3804950
IF(INPT.EQ.MINUS1) GOTO 410	S3804960
600 IF (INPT.EQ.IBLNK.OR.INPT.EQ.IHE.OR.INPT.EQ.IIHES) GO TO 660	S3804970
IF (INPT.EQ.IHA.OR.INPT.EQ.IIHAN) GO TO 610	S3804980
IF (BATCH) GO TO 660	S3804990
WRITE (ICU,9004) INV,OFF,19,0	S3805000
GO TO 590	S3805010
610 WRITE(ICU,9013) IESA,IESJ	S3805020
RNPT = 0.0	S3805030
CALL IFNBR(IFRMT,14,IER,IIU)	S3805040
IF (BATCH .OR. IER .EQ. 0) GO TO 630	S3805050
620 WRITE (ICU,9004) INV,OFF,19,1	S3805060
GO TO 610	S3805070
630 CALL CODE(80)	S3805080
READ (IFRMT,*) RNPT	S3805090
IF (BATCH) GO TO 650	S3805100
IF (RNPT .EQ. MINS1) GO TO 640	S3805110
IF (RNPT .EQ. MINS9) GO TO 900	S3805120
IF (RNPT .GT. 0.0) GO TO 650	S3805130
GO TO 620	S3805140
640 WRITE(ICU,9023) IESCAJ	S3805150
GOTO 580	S3805160
650 IF(RNPT.GT.0.0) SIGMAR=RNPT	S3805170

660	WRITE(ICU,9014) IESA,IESJ,SIGMAR	S3805180
670	CONTINUE	S3805190
	SIGMER = SIGMAR	S3805200
	IF(IBATCH) IIU = IIUTMP	S3805210
	IBATCH = .FALSE.	S3805220
C		S3805230
	IF(.NOT.BATCH) GOTO 680	S3805240
	READ(IIU,9002) I	S3805250
	IF(I .NE. IHA.AND.I .NE. IIHAN) GOTO 880	S3805260
	IBATCH = .TRUE.	S3805270
	IIUTMP = IIU	S3805280
	IIU = ICU	S3805290
680	WRITE(ICU,9016) ULINE,OFF,INV,SIGMER,OFF,ULINE,OFF	S3805300
	INPT = IBLNK	S3805310
	READ(IIU,9002) INPT	S3805320
	IF(BATCH) GOTO 690	S3805330
	IF(INPT .EQ. MINUS9) GOTO 900	S3805340
	IF(INPT .NE. MINUS1) GOTO 690	S3805350
	WRITE(ICU,9023) IESCAJ	S3805360
	GOTO 580	S3805370
690	IF (INPT.EQ.IBLNK.OR.INPT.EQ.IHE.OR.INPT.EQ.IIHES) GO TO 750	S3805380
	IF (INPT.EQ.IHA.OR.INPT.EQ.IIHAN) GO TO 700	S3805390
	IF (BATCH) GO TO 750	S3805400
	WRITE (ICU,9004) INV,OFF,20,0	S3805410
	GO TO 680	S3805420
700	WRITE(ICU,9017) IESA,IESJ	S3805430
	RNPT = 0.0	S3805440
	CALL IFNBR(IFRMT,14,IER,IIU)	S3805450
	IF (BATCH .OR. IER .EQ. 0) GO TO 720	S3805460
710	WRITE (ICU,9004) INV,OFF,20,1	S3805470
	GO TO 700	S3805480
720	CALL CODE(80)	S3805490
	READ (IFRMT,*) RNPT	S3805500
	IF(BATCH) GOTO 740	S3805510
	IF (RNPT .EQ. MINS1) GO TO 730	S3805520
	IF (RNPT .EQ. MINS9) GO TO 900	S3805530
	IF (RNPT .GT. 0.0) GO TO 740	S3805540
	GO TO 710	S3805550
730	WRITE(ICU,9023) IESCAJ	S3805560
	GOTO 670	S3805570
740	IF(RNPT.GT.0.0) SIGMER=RNPT	S3805580
750	WRITE(ICU,9018) IESA,IESJ,SIGMER	S3805590
	IF(IBATCH) IIU = IIUTMP	S3805600
C		S3805610
C		S3805620
C		S3805630
	IF(IRUN .LT. 3) GOTO 880	S3805640
760	ISIG = 0	S3805650
	WRITE(ICU,9015) INVNDR,INV,OFF,ULINE,OFF	S3805660
	INPT = IBLNK	S3805670
	READ(IIU,9002) INPT	S3805680
	IF(INPT .EQ. MINUS9) GOTO 900	S3805690

IF(INPT .NE. MINUS1) GOTO 770	S3805700
WRITE(ICU,9023) IESCAJ,IESCAJ	S3805710
GOTO 670	S3805720
770 WRITE(ICU,9006) IESA,IESD,IESJ	S3805730
IF (INPT.EQ.IBLNK.OR.INPT.EQ.INJ.OR.INPT.EQ.INOJ) GO TO 880	S3805740
IF (INPT.EQ.IYSJ.OR.INPT.EQ.IYESJ) GO TO 780	S3805750
WRITE (ICU,9004) INV,OFF,20,2	S3805760
GO TO 760	S3805770
C SET USER-ENTERED SIGAP & SIGEP FLAG FOR ROUTINE TURB4 IN RCLDM.	S3805780
780 ISIG = 1	S3805790
I = 2	S3805800
790 CONTINUE	S3805810
IF (ALT(I) .EQ. HM(1)) GO TO 800	S3805820
IF (ALT(I) .GT. HM(1)) GO TO 810	S3805830
SIGAP(I) = SIGMAR	S3805840
SIGEP(I) = SIGMER	S3805850
GO TO 820	S3805860
800 SIGAP(I) = SIGMAR*.74074074	S3805870
SIGEP(I) = SIGMER*.74074074	S3805880
GO TO 820	S3805890
810 SIGAP(I) = 1.0	S3805900
SIGEP(I) = 1.0	S3805910
820 WRITE (ICU,9019) I,SIGAP(I),SIGEP(I)	S3805920
CALL IFNBR(IFRMT,20,IER,IIU)	S3805930
IF (BATCH .OR. IER .EQ. 0) GO TO 840	S3805940
830 WRITE (ICU,9004) INV,OFF,20,3	S3805950
GO TO 790	S3805960
840 RNPT = 0.0	S3805970
RNPT1 = 0.0	S3805980
CALL CODE(80)	S3805990
READ (IFRMT,*) RNPT,RNPT1	S3806000
IF (RNPT .EQ. MINS1) GO TO 850	S3806010
IF (RNPT .EQ. MINS9) GO TO 900	S3806020
IF (RNPT .GE. 0.0.AND.RNPT1 .GE. 0.0) GO TO 870	S3806030
GO TO 830	S3806040
850 WRITE(ICU,9023) IESCAJ,IESCAJ	S3806050
IF(I-2) 760,760,860	S3806060
860 I=I-1	S3806070
GO TO 790	S3806080
870 IF (RNPT .GT. 0.0) SIGAP(I) = RNPT	S3806090
IF (RNPT1.GT. 0.0) SIGEP(I) = RNPT1	S3806100
WRITE(ICU,9020) IESA,IESJ,I,SIGAP(I),SIGEP(I)	S3806110
I = I + 1	S3806120
IF(NUM-I) 880,790,790	S3806130
880 SIGEP(I)=SIGMER	S3806140
SIGAP(I)=SIGMAR	S3806150
GOTO 910	S3806160
C-----ERROR EXIT.	S3806170
890 IERROR(1) = MINS1	S3806180
GOTO 910	S3806190
900 IERROR(1) = 1	S3806200
910 NNNEST = 2	S3806210

NNTRY = 3
CALL REEDM
END

S3806220
S3806230
S3806240

INTEGER FUNCTION IHIDX(Z,N,VAR,II)	S3900000
. , UPDATE: 8213 SOURCE: 30 MAR 79 LOCATION: KSC	S3900010
C-----	S3900020
DIMENSION Z(1)	S3900030
IF(VAR.LT.Z(1)) VAR=Z(1)	S3900040
IF(VAR.GT.Z(N)) VAR=Z(N)	S3900050
DO 10 I=1,N-1	S3900060
IF(VAR.GE.Z(I).AND.VAR.LT.Z(I+1)) GO TO 20	S3900070
J=I+1	S3900080
10 CONTINUE	S3900090
I=I-1	S3900100
20 IF(II.EQ.1.AND.ABS(VAR-Z(I)).LT.ABS(Z(I+1)-VAR)) I=I-1	S3900110
IF(II.EQ.0.AND.ABS(VAR-Z(I)).GT.ABS(Z(I+1)-VAR)) I=I+1	S3900120
IHIDX=I	S3900130
RETURN	S3900140
END	S3900150

REEDM SOURCE MODULE &RCONM

FTN4	S4000000
PROGRAM RCONM(5)	S4000010
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S4000020
C::	S4000030
C::	S4000040
C:::	:::S4000050
C:::	:::S4000060
C::: ORGANIZATION: H. E. CRAMER CO., INC.	:::S4000070
C:::	:::S4000080
C::: WORK FOR: DR. J. B. STEPHENS (ES84)	:::S4000090
C:::	:::S4000100
C::: PROGRAM CODE: RCONM	:::S4000110
C:::	:::S4000120
C::: PROGRAM DESCRIPTION:	:::S4000130
C::: THIS PROGRAM CALCULATES THE DOSAGE, CONCENTRATION, TIME MEAN	:::S4000140
C::: CONCENTRATION, AND MAXIMUM CENTERLINE CONCENTRATION FOR THE	:::S4000150
C::: MEAN WIND DIRECTION RADIAL AT EVERY 1000 METERS DOWNWIND FROM	:::S4000160
C::: THE LAUNCH SITE.	:::S4000170
C:::	:::S4000180
C::	S4000190
C::	S4000200
C	S4000210
C	S4000220
Cc	S4000230
C**** BEGIN COMMON AREA ****	S4000240
C 04/02/82	S4000250
C-----MATH PARAMETERS AND CONSTANTS	S4000260
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S4000270
C-----INPUT OPTIONS	S4000280
REAL LAMBDA	S4000290
INTEGER FILE,GOOD,TITLE	S4000300
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S4000310
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S4000320
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S4000330
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S4000340
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S4000350
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S4000360
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S4000370
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S4000380
. FS(20),MDLNAM(12),DBAR(20)	S4000390
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S4000400
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S4000410
. MODEL4,MODEL5,MODEL6	S4000420
INTEGER RUNNUM,RT,CL,CS	S4000430
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S4000440
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S4000450
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S4000460
. ,MIXING,MAXDEP,LAYBOT(3)	S4000470
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S4000480
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S4000490

.	MINUS1,MINUS9,MIN51,MIN59,	S4000500
.	MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S4000510
.	RT(24),TPROPC,IDXRT	S4000520
C-----	TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S4000530
	INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S4000540
.	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S4000550
.	CLRLNE,INSLNE,DELNE	S4000560
	COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S4000570
.	INVNDR(2),ULINE(2),	S4000580
.	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S4000590
.	CLRLNE,INSLNE,DELNE,	S4000600
.	IESCAJ(3),NULL,IBLNK,	S4000610
.	IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S4000620
C-----	VEHICLE PARAMETERS	S4000630
	COMMON /VCLPR/ VPAR(17)	S4000640
C-----	TIME PARAMETERS	S4000650
	COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	S4000660
.	LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	S4000670
C-----	SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)	S4000680
	COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),	S4000690
.	RH(30),PTEMP(30),SIGEP(30),SIGAP(30)	S4000700
C-----	LAYER PARAMETERS	S4000710
	COMMON /LAYER/ DX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),	S4000720
.	SIGYO(29)	S4000730
C-----	CALCULATED BOUNDARY DATA (FOR NEW LAYERS)	S4000740
	COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)	S4000750
C-----	CALCULATED NEW LAYER PARAMETERS	S4000760
	COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),	S4000770
.	SPEEDN(32)	S4000780
C-----	CONVERSION FACTORS	S4000790
	COMMON /CNVRT/ QCONV(4),QPDEPH	S4000800
C		S4000810
C*****	COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****	S4000820
	COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)	S4000830
C-----	READ/WRITE BUFFER	S4000840
C-----	A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879	S4000850
C*****		S4000860
C		S4000870
C-----	EQUIVALENCE STATEMENTS	S4000880
	EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))	S4000890
.	,(IPU2,IPAR(4)),(IPU3,IPAR(5))	S4000900
	EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)	S4000910
C		S4000920
C****	E N D O F C O M M O N A R E A	****S4000930
Cc		S4000940
C		S4000950
	DIMENSION IPL(12)	S4000960
	DIMENSION WTMOL(3),CDHOLD(8,3),IER(2)	S4000970
	DIMENSION RANGE(30,1),BEARNG(30,1),CDAMXS(1),	S4000980
1	VALUES(30,1),PEAKS(2,1),CLDTIM(2,2,30),CLDDTM(2,3,60)	S4000990
	DIMENSION PHIS(50),UBARNK(50),SIGAPK(50),SIGEPK(50)	S4001000
C		S4001010

EQUIVALENCE (PLUS,RANGE),(PLUS(181),BEARNG),	S4001020
1 (PLUS(541),CDAMXS),(PLUS(547),VALUES),	S4001030
2 (PLUS(727),PEAKS), (ERR,IER), (CLDTIM,CLDDTM)	S4001040
C	S4001050
C-----DATA STATEMENTS.	S4001060
C	S4001070
DATA IPL/2H H,2HCL,2H ,2H C,2HO2,2H ,2H C,2HO ,2H ,2HAL,2H2O,	S4001080
.2H3 /	S4001090
C	S4001100
HCL CO2 CO	S4001110
DATA WTMOL/36.46,44.01,28.01/	S4001120
DATA ISXS,NXS,INCXS /2,30,1/	S4001130
DATA RAD/.01745329/	S4001140
DATA JVERSN/8213/	S4001150
C	S4001160
CF-----FORMAT STATEMENTS	S4001170
9001 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S4001180
*,I2,1H.,I1/)	S4001190
9002 FORMAT(1H1,38(2H**)/1X,8(2H**),44X,8(2H**)/	S4001200
1 1X,8(2H**),3X,13HREEDM UPDATE,I5,11H LOCATION ,2A2,8X,8(2H**)/	S4001210
2 1X,8(2H**),5X,12A2,6H MODEL,9X,8(2H**)/	S4001220
3 1X,8(2H**),44X,8(2H**)/1X,38(2H**)/)	S4001230
9003 FORMAT(1X,8(2H**),7X,31HMAXIMUM CENTERLINE CALCULATIONS,6X,	S4001240
. 8(2H**)/20X,5H FOR ,3A2,16H AT A HEIGHT OF ,F8.2,7H METERS/	S4001250
.15X,17H DOWNWIND FROM A ,14A2,7H LAUNCH/,4X,	S4001260
.41H CALCULATIONS APPLY TO THE LAYER BETWEEN ,F7.2,5H AND ,	S4001270
.F7.2,7H METERS//9X,33H THE METEOROLOGICAL DATA IS FROM ,I5,2A2,I4	S4001280
.,1X,2A2,I4/20X,16H LAUNCH TIME IS,I11,2A2,I4,1X,2A2,I4/	S4001290
. 16X,20HTIME OF EXECUTION IS,I11,2A2,I4,1X,2A2,I4)	S4001300
9004 FORMAT(/35X,2(7X,5HCLOUD)/5X,5HRANGE,7X,7HBEARING,6X,5HTOTAL,6X,	S4001310
120HARRIVAL DEPARTURE/4X,2(8HFROM PAD,5X),6HDOSAGE,7X,	S4001320
2 2(4HTIME,8X))	S4001330
9005 FORMAT(5F12.3)	S4001340
9006 FORMAT(/60X,5HRANGE,5X,7HBEARING/59X,9(2H--)/F11.3,	S4001350
128H IS THE MAXIMUM TOTAL DOSAGE,17X,2F10.1)	S4001360
9007 FORMAT(28X,8H(MILLI G/4X,33H(METERS) (DEGREES) SEC/M**3),	S4001370
1 5X,2(5H(MIN),7X)/3X,29(2H--))	S4001380
9008 FORMAT(4X,33H(METERS) (DEGREES) (PPM SEC),5X,2(5H(MIN),7X)/	S4001390
1 3X,29(2H--))	S4001400
9009 FORMAT(/30X,5HPEAK ,2(7X,5HCLOUD)/5X,5HRANGE,7X,7HBEARING,5X,	S4001410
132HCONCEN- ARRIVAL DEPARTURE/	S4001420
2 4X,32HFROM PAD FROM PAD TRATION,7X,2(4HTIME,8X))	S4001430
9010 FORMAT(4X,31H(METERS) (DEGREES) (PPM),2(7X,5H(MIN))/	S4001440
1 3X,29(2H--))	S4001450
9011 FORMAT(28X,9H(MILLI G//4X,31H(METERS) (DEGREES) M**3),	S4001460
1 2(7X,5H(MIN))/3X,29(2H--))	S4001470
9012 FORMAT(/60X,5HRANGE,5X,7HBEARING/59X,9(2H--)/F11.3,	S4001480
134H IS THE MAXIMUM PEAK CONCENTRATION,11X,2F10.1)	S4001490
9013 FORMAT(43H1DIAGNOSTICS FOR DOSAGE/CONCENTRATION MODEL/)	S4001500
9014 FORMAT(2A2,A1)	S4001510
9015 FORMAT(/28X,F4.1,5H MIN./30X,5HMEAN ,2(7X,5HCLOUD)/5X,	S4001520
1 5HRANGE,7X,7HBEARING,5X,32HCONCEN- ARRIVAL DEPARTURE/	S4001530
2 4X,32HFROM PAD FROM PAD TRATION,7X,2(4HTIME,8X))	

9016	FORMAT(//60X,17HRANGE BEARING/59X,9(2H--)/F11.3,	S4001540
	116H IS THE MAXIMUM ,F4.1,25H MIN. MEAN CONCENTRATION ,2F10.1)	S4001550
9017	FORMAT(A2,1X,12A2,30H MODEL IS PROCESSING RANGE AT ,2A2,F7.1,2A2,	S4001560
	17H METERS)	S4001570
9018	FORMAT(2A2,10X,2A2,8HPRINTING,2A2)	S4001580
9019	FORMAT(3A2)	S4001590
C		S4001600
C!!!!	H.E.C COPY ONLY.	S4001610
9020	FORMAT(56HDO YOU WISH MAXIMUM CENTERLINE DOSAGE & CONCENTRATION? (S4001620
	*,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_)	S4001630
9021	FORMAT (A2)	S4001640
C!!!!		S4001650
C		S4001660
9022	FORMAT(40H DIAGNOSTIC RUN. ENTER ISXS,NXS,INCXS:_)	S4001670
9023	FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS	S4001680
	* IF -1 TYPED AGAIN/)	S4001690
C		S4001700
C		S4001710
	IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S4001720
C-----	INITIALIZE.	S4001730
	TIMIN = TIMAV*0.016666667	S4001740
C		S4001750
C!!!!	H.E.C COPY ONLY.	S4001760
	IF (BATCH) GO TO 30	S4001770
10	WRITE (ICU,9020) INVNDR,INV,OFF,ULINE,OFF	S4001780
	READ (IIU,9021) IFRMT1	S4001790
	IF (IFRMT1.EQ.INJ.OR.IFRMT1.EQ.INOJ) GO TO 310	S4001800
	IF (IFRMT1.EQ.IBLNK.OR.IFRMT1.EQ.IYSJ.OR.IFRMT1.EQ.IYESJ) GO TO 20	S4001810
	WRITE (ICU,9001) INV,OFF,0,0	S4001820
	GO TO 10	S4001830
20	WRITE (ICU,9019) CURSUP,CLRLNE	S4001840
30	CONTINUE	S4001850
C!!!!		S4001860
C		S4001870
	JER = 0	S4001880
C	CLEAR WORK SPACE.	S4001890
	DO 40 I = 1,900	S4001900
40	PLUS(I) = 0.0	S4001910
C-----	COMPUTE CONVERSION FACTORS FOR ALL POLLUTANTS	S4001920
C-----	SEE VPARS ARRAY IN PROGRAM REEDM FOR SPECIES %.	S4001930
	XXX=1000.0*22.4*1013.2*TEMP(1)/(273.16*PRESS(1))	S4001940
	DO 50 I=1,3	S4001950
50	QCONV(I)=(XXX/WTMOL(I))*VPAR(I+12)	S4001960
	QCONV(4)=1000.0*VPAR(16)	S4001970
	IF(IRUN .EQ. 4) WRITE(IOU,9013)	S4001980
C-----	INITIALIZE PARAMETERS FOR BOUNDARY LAYERS.	S4001990
	ILK=1	S4002000
	IF(CALHT.GT.ALT(LAYTOP(1)+1)) ILK=2	S4002010
	JF=NLAIS+ILK	S4002020
	IBOT=LAYBOT(ILK)	S4002030
	ITOP=LAYTOP(ILK)	S4002040
	YT = DIRN(JF)+180.0	S4002050

IF(YT .GT. 360.0) YT = YT - 360.0	S4002060
ZBSL=0.0	S4002070
IF(IBOT.GT.1) ZBSL = ALT(IBOT)	S4002080
ZTPL = ALT(ITOP+1)	S4002090
ZTPAL = ZTPL	S4002100
IF(LAYTOP(ILK+1) .GT. 0) ZTPAL = ALT(LAYTOP(ILK+1)+1)	S4002110
IF(GRVSET) CALL SHEAR(UBARNK,PHIS,SIGAPK,SIGEPK,1)	S4002120
C	S4002130
C	S4002140
C	S4002150
C	S4002160
C	S4002170
IF(IRUN .NE. 4) GOTO 110	S4002180
60 WRITE(ICU,9022)	S4002190
CALL IFNBR(IFRMT,20,IER,IIU)	S4002200
IF (IER .EQ. 0) GO TO 80	S4002210
70 WRITE (ICU,9001) INV,OFF,0,0.	S4002220
IF (BATCH) GO TO 320	S4002230
GO TO 60	S4002240
80 CALL CODE(80)	S4002250
READ (IFRMT,*) ISXS,NXS,INCXS	S4002260
IF (ISXS .NE. MINS1) GO TO 90	S4002270
JER = JER+1	S4002280
IF (JER .GT. 1) GO TO 320	S4002290
WRITE (ICU,9023)	S4002300
GO TO 60	S4002310
90 IF (ISXS .EQ. MINS9) GO TO 330	S4002320
IF (ISXS .LE.NXS.AND.INCX.S.LE.NXS) GO TO 100	S4002330
GO TO 70	S4002340
100 CONTINUE	S4002350
WRITE(ICU,9014) IESCAJ	S4002360
110 CONTINUE	S4002370
C	S4002380
C-----LOOP THROUGH EACH RANGE (I = ISXS,NXS,INCXS)	S4002390
DO 130 I= ISXS,NXS,INCXS	S4002400
XT=FLOAT(I-1)*1000.0	S4002410
IF(.NOT.BATCH) WRITE(ICU,9017) CURSUP,MDLNAM,INV,XT,OFF	S4002420
CALL BREAK(JF,XT,YT,I,.FALSE.,CDHOLD,PHIS,UBARNK,CLDTIM(1,1,I),	S4002430
1 SIGAPK,SIGEPK)	S4002440
DO 120 J = 1,6	S4002450
IF(CDAMXS(J) .GT. VALUES(I,J)) GOTO 120	S4002460
CDAMXS(J) = VALUES(I,J)	S4002470
PEAKS(1,J) = RANGE(I,J)	S4002480
PEAKS(2,J) = BEARNG(I,J)	S4002490
120 CONTINUE	S4002500
130 CONTINUE	S4002510
IF(.NOT.BATCH) WRITE(ICU,9018) CURSUP,CLRDSP,BLNKNG,OFF	S4002520
C-----CALCULATE THE NUMBER OF POLLUTANTS	S4002530
NPOL=0	S4002540
DO 140 I=1,4	S4002550
IF(IPLLNT(I).EQ.0) GO TO 150	S4002560
140 NPOL=NPOL+1	S4002570

150 CONTINUE	S4002580
C	S4002590
C-----WRITE OUT CON,DOS,AVCON,PASSTM,AND X,Y LOCATION	S4002600
C-----CDAMXS(1-6) = CONC.GAS, DOS.GAS, TIME-MEAN CONC.GAS,	S4002610
C-----CONC.AL2O3, DOS.AL2O3, TIME-MEAN CONC. AL2O3	S4002620
C	S4002630
IF(NPOL.EQ.0) GO TO 310	S4002640
DO 300 JJ=1,NPOL	S4002650
IP = IPLLNT(JJ)	S4002660
IDX=(JJ-1)*7	S4002670
KDX=IP*3-3	S4002680
DO 300 IS = 1,3	S4002690
C PRINT HEADING.	S4002700
WRITE(IOU,9002) IVERSN,LOCATN,MDLNAM	S4002710
A1 = ZTPL	S4002720
IF(IP .EQ. 4) A1 = ZTPAL	S4002730
WRITE(IOU,9003) (IPL(KDX+J),J=1,3),CALHT,TITLE,ZBSL,A1,	S4002740
. ISTEIME,LSDT,ISDAY,ISMON,ISYEAR,LTIME,LSDT,LDAY,LMON,LYEAR,	S4002750
. JTIME,LSDT,JDAY,JMON,JYEAR	S4002760
IF(IS-2) 160,170,180	S4002770
160 WRITE(IOU,9009)	S4002780
GOTO 190	S4002790
170 WRITE(IOU,9004)	S4002800
GOTO 190	S4002810
180 WRITE(IOU,9015) TIMIN	S4002820
190 ISS = IS	S4002830
IF(IP .NE. 4) GOTO 220	S4002840
ISS = IS + 3	S4002850
CD1 = CDAMXS(ISS)	S4002860
IPASTM = 2	S4002870
IF(IS-2) 200,210,200	S4002880
200 WRITE(IOU,9011)	S4002890
GOTO 250	S4002900
210 WRITE(IOU,9007)	S4002910
GOTO 250	S4002920
220 I1 = 2	S4002930
CD1 = CDAMXS(ISS)*QCONV(IP)	S4002940
IPASTM = 1	S4002950
IF(IS-2) 230,240,230	S4002960
230 WRITE(IOU,9010)	S4002970
GOTO 250	S4002980
240 WRITE(IOU,9008)	S4002990
C BEGIN LOOP OVER RANGES.	S4003000
250 DO 260 IXS = ISXS,NXS,INCXS	S4003010
VALUE = VALUES(IXS,ISS)	S4003020
IF(IP .NE. 4) VALUE = VALUE*QCONV(IP)	S4003030
IF(VALUE .LT. .0005) GOTO 260	S4003040
WRITE(IOU,9005) RANGE(IXS,ISS),BEARNG(IXS,ISS),VALUE,	S4003050
1 CLDTIM(1,IPASTM,IXS),CLDTIM(2,IPASTM,IXS)	S4003060
260 CONTINUE	S4003070
C PRINT MAXIMUM VALUE.	S4003080
IF(IS-2) 270,280,290	S4003090

270	WRITE(IOU,9012) CD1,PEAKS(1,ISS),PEAKS(2,ISS)	S4003100
	GOTO 300	S4003110
280	WRITE(IOU,9006) CD1,PEAKS(1,ISS),PEAKS(2,ISS)	S4003120
	GOTO 300	S4003130
290	WRITE(IOU,9016) CD1,TIMIN,PEAKS(1,ISS),PEAKS(2,ISS)	S4003140
300	CONTINUE	S4003150
	IF(.NOT.BATCH) WRITE(ICU,9019) CURSUP,CURLFT,CLRDSP	S4003160
310	CONTINUE	S4003170
	QCONV(4) = 1.0	S4003180
C		S4003190
	NNNEST = 3	S4003200
	NNNTRY = 4	S4003210
	GO TO 350	S4003220
C		S4003230
C		S4003240
C		S4003250
320	IERROR(1) = MINS1	S4003260
	GO TO 340	S4003270
330	IERROR(1) = 1	S4003280
340	NNNEST = 1	S4003290
	NNNTRY = 3	S4003300
350	CONTINUE	S4003310
	CALL REEDM	S4003320
	END	S4003330

REEDM SOURCE MODULE &RCNOM

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FTN4
PROGRAM RCNOM(5)
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C::::::::::::::::::::::::::::::::::::::::::::::::::::S4100030
C::::::::::::::::::::::::::::::::::::::::::::::::::::S4100040
C::: ::S4100050
C::: ::S4100060
C::: ORGANIZATION: H. E. CRAMER CO., INC. ::S4100070
C::: ::S4100080
C::: WORK FOR: DR. J. B. STEPHENS (ES84) ::S4100090
C::: ::S4100100
C::: PROGRAM CODE: RCNOM ::S4100110
C::: ::S4100120
C::: PROGRAM DESCRIPTION: ::S4100130
C::: THIS PROGRAM CALCULATES THE DOSAGE, CONCENTRATION, TIME MEAN ::S4100140
C::: CONCENTRATION, AND MAXIMUM CENTERLINE CONCENTRATION FOR THE ::S4100150
C::: MEAN WIND DIRECTION RADIAL AT EVERY 1000 METERS DOWNWIND FROM ::S4100160
C::: THE LAUNCH SITE. ::S4100170
C::: ::S4100180
C::::::::::::::::::::::::::::::::::::::::::::::::::::S4100190
C::::::::::::::::::::::::::::::::::::::::::::::::::::S4100200
C S4100210
C S4100220
Cc S4100230
C**** BEGIN COMMON AREA ****S4100240
C 04/02/82 S4100250
C-----MATH PARAMETERS AND CONSTANTS S4100260
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S4100270
C-----INPUT OPTIONS S4100280
REAL LAMBDA S4100290
INTEGER FILE,GOOD,TITLE S4100300
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S4100310
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S4100320
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S4100330
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S4100340
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S4100350
. ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2) S4100360
. ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S4100370
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S4100380
. FS(20),MDLNAM(12),DBAR(20) S4100390
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S4100400
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S4100410
. MODEL4,MODEL5,MODEL6 S4100420
INTEGER RUNNUM,RT,CL,CS S4100430
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S4100440
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S4100450
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S4100460
. ,MIXING,MAXDEP,LAYBOT(3) S4100470
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S4100480
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S4100490

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.	MINUS1,MINUS9,MIN51,MIN59,	S4100500
.	MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S4100510
.	RT(24),TPROPC,IDXRT	S4100520
C-----	TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S4100530
	INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S4100540
.	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S4100550
.	CLRLNE,INSLNE,DELNE	S4100560
.	COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S4100570
.	INVNDR(2),ULINE(2),	S4100580
.	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S4100590
.	CLRLNE,INSLNE,DELNE,	S4100600
.	IESCAJ(3),NULL,IBLNK,	S4100610
.	IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S4100620
C-----	VEHICLE PARAMETERS	S4100630
	COMMON /VCLPR/ VPAR(17)	S4100640
C-----	TIME PARAMETERS	S4100650
	COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	S4100660
.	LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	S4100670
C-----	SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)	S4100680
	COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),	S4100690
.	RH(30),PTEMP(30),SIGEP(30),SIGAP(30)	S4100700
C-----	LAYER PARAMETERS	S4100710
	COMMON /LAYER/ DX,DY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),	S4100720
.	SIGYO(29)	S4100730
C-----	CALCULATED BOUNDARY DATA (FOR NEW LAYERS)	S4100740
	COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)	S4100750
C-----	CALCULATED NEW LAYER PARAMETERS	S4100760
	COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),	S4100770
.	SPEEDN(32)	S4100780
C-----	CONVERSION FACTORS	S4100790
	COMMON /CNVRT/ QCONV(4),QPDEPH	S4100800
C		S4100810
C*****	COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****	S4100820
	COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)	S4100830
C-----	READ/WRITE BUFFER	S4100840
C-----	A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879	S4100850
C*****	*****	S4100860
C		S4100870
C-----	EQUIVALENCE STATEMENTS	S4100880
	EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))	S4100890
.	,(IPU2,IPAR(4)),(IPU3,IPAR(5))	S4100900
	EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)	S4100910
C		S4100920
C****	E N D O F C O M M O N A R E A	****S4100930
Cc		S4100940
	LOGICAL IBATCH	S4100950
C		S4100960
	DIMENSION IPL(12)	S4100970
	DIMENSION WTMOL(3),DISBUF(15,1),CDHOLD(8,3),CDOUT(9),	S4100980
1	KKMAX(3),YYMAX(3),IER(2)	S4100990
	DIMENSION CDAMXS(3),	S4101000
1	CLDDTM(2,3,60)	S4101010

	DIMENSION PHIS(50),UBARNK(50),SIGAPK(50),SIGEPK(50),IDDISR(10,60)	S4101020
C		S4101030
	EQUIVALENCE (PLUS,DISBUF),	S4101040
	1 (ERR,IER)	S4101050
C		S4101060
C	-----DATA STATEMENTS.	S4101070
C		S4101080
	DATA IPL/2H H,2HCL,2H ,2H C,2HO2,2H ,2H C,2HO ,2H ,2HAL,2H2O,	S4101090
	.2H3 /	S4101100
C	HCL CO2 CO	S4101110
	DATA WTMOL/36.46,44.01,28.01/	S4101120
	DATA IBATCH /.FALSE./	S4101130
	DATA RAD/.01745329/	S4101140
	DATA JVERSN/8213/	S4101150
C		S4101160
CF	-----FORMAT STATEMENTS	S4101170
	9001 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S4101180
	*,I2,1H.,I1/)	S4101190
	9002 FORMAT(A2)	S4101200
	9003 FORMAT(1H1,38(2H**)/1X,8(2H**),44X,8(2H**)/	S4101210
	1 1X,8(2H**),3X,13HREEDM UPDATE,I5,11H LOCATION ,2A2,8X,8(2H**)/	S4101220
	2 1X,8(2H**),5X,12A2,6H MODEL,9X,8(2H**)/	S4101230
	3 1X,8(2H**),44X,8(2H**)/1X,38(2H**)/)	S4101240
	9004 FORMAT(S4101250
	1 1X,8(2H**),7X,30HDISCRETE RECEPTOR CALCULATIONS,7X,8(2H**)//	S4101260
	2 35X,4HFOR ,3A2/15X,17H DOWNWIND FROM A ,14A2,7H LAUNCH/4X,	S4101270
	3 40HCALCULATIONS APPLY TO THE LAYER BETWEEN ,F7.2,5H AND ,	S4101280
	3 F7.2,7H METERS//5X,32HTHE METEOROLOGICAL DATA IS FROM ,I5,2A2,	S4101290
	4 I4,1X,2A2,I4/15X,16H LAUNCH TIME IS,I11,2A2,I4,1X,2A2,I4/	S4101300
	5 11X,20HTIME OF EXECUTION IS,I11,2A2,I4,1X,2A2,I4)	S4101310
	9005 FORMAT(/49X,F5.2,5H MIN./21X,15HCALCU- PEAK,14X,25H MEAN CS	S4101320
	1LOUD CLOUD/3X,74HRANGE BEARING LATION CONCEN- TOTAL	S4101330
	2 CONCEN- ARRIVAL DEPARTURE/1X,2(8HFROM PAD,2X),44HHEIGHT TRATS	S4101340
	3ION DOSAGE TRATION TIME,6X,4HTIME)	S4101350
	9006 FORMAT(75H (METERS) (DEGREES) (METERS) (PPM) (PPM/SEC) (PPM)	S4101360
	1 (MIN) (MIN),6X,10HIDENTIFIER/1X,49(2H--))	S4101370
	9007 FORMAT(29X,3(10H(MILLI G /)/75H (METERS) (DEGREES) (METERS) METER*	S4101380
	1*3) M**3/SEC) METER**3) (MIN) (MIN),6X,10HIDENTIFIER/	S4101390
	2 1X,49(2H--))	S4101400
	9008 FORMAT(F8.1,F9.1,F10.1,F9.2,F10.2,F10.3,F9.1,F10.1,2X,10A2)	S4101410
	9009 FORMAT (1X,37(2H**)/1X,52H* PEAK CONCENTRATION * TOTAL DOS	S4101420
	*SAGE * ,F3.0,19HMIN. AVERAGE CONC.*/2H *,3(25H-10 DEG. POINT	S4101430
	+10 DEG.)/1X,37(2H**))	S4101440
	9010 FORMAT(/60X,16HRANGE BEARING/58X,9(2H--)/	S4101450
	1 F10.2,34H IS THE MAXIMUM PEAK CONCENTRATION,11X,2F10.1/	S4101460
	1 F10.2,28H IS THE MAXIMUM TOTAL DOSAGE,17X,2F10.1/	S4101470
	1 F10.2,15H IS THE MAXIMUM,F6.2,24H MIN. MEAN CONCENTRATION,2F10.1)	S4101480
	9011 FORMAT(43H1DIAGNOSTICS FOR DOSAGE/CONCENTRATION MODEL/)	S4101490
	9012 FORMAT(2A2,A1)	S4101500
	9013 FORMAT(3A2)	S4101510
	9014 FORMAT(46H DO YOU WISH DISCRETE RECEPTOR CALCULATIONS? (,2A2,1HY,	S4101520
	1 2A2,2HES,2A2,1H,,2A2,1HN,2A2,2HO,,2A2,3HLU#,2A2,16H OF DATA FILE)	S4101530

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2: ) S4101540
9015 FORMAT(2A2,68H ENTER DISCRETE RECEPTOR LOCATION RELATIVE TO LAUNCHS4101550
1 PAD. A 20 CHAR./52H COMMENT MAY BE ENTERED STARTING UNDER THE ASTS4101560
2ERISK.,11X,1H*/34H RANGE(M),BEARING(DEG),HEIGHT(M):_) S4101570
9016 FORMAT(22H CALCULATION HEIGHT OF,F8.2,20H METERS IS TOO HIGH., S4101580
119H PLEASE RE-ENTER:_) S4101590
9017 FORMAT(22H CALCULATION HEIGHT OF,F8.2,42H METERS IS GREATER THAN 5S4101600
1 METERS (MAXIMUM)/39H AND WILL CAUSE ERRONEOUS A1203 RESULTS/ S4101610
2 11X,26HDO YOU WISH TO CONTINUE? (,2A2,1HY,2A2,2HES,2A2, S4101620
3 1HN,2A2,1HO,2A2,3H):_) S4101630
9018 FORMAT (/26H DISCRETE RECEPTOR RANGE =,F8.1,11H, BEARING =,F6.1, S4101640
*13H, CALC. HT. =,F7.2/21H CLOUD ARRIVAL TIME =,F5.1,29H MIN., CLOUS4101650
*D DEPARTURE TIME =,F5.1,5H MIN./2H *,4X,13HCONCENTRATION,6X,1H*, S4101660
*9X,6HDOSAGE,9X,1H*,1X,21HTIME-AV CONCENTRATION) S4101670
9019 FORMAT (32X,3H** ,4A2,A1,2A2,3H **/2H *,2(F6.2,2X),F6.2,2H *,3(F7.S4101680
*2,1X),1H*,3(F7.3,1X)) S4101690
9020 FORMAT(63H A MAXIMUM OF 60 DISCRETE RECEPTOR LOCATIONS HAVE BEEN ES4101700
1INTERED./29H THIS SECTION IS TERMINATED. _) S4101710
9021 FORMAT(59H DO YOU WISH TO ENTER ANOTHER DISCRETE RECEPTOR LOCATIONS4101720
1? (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S4101730
9022 FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS4101740
* IF -1 TYPED AGAIN/) S4101750
C S4101760
C S4101770
IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH) S4101780
C-----INITIALIZE. S4101790
TIMIN = TIMAV*0.016666667 S4101800
JER = 0 S4101810
C CLEAR WORK SPACE. S4101820
DO 10 I = 1,900 S4101830
10 PLUS(I) = 0.0 S4101840
C-----COMPUTE CONVERSION FACTORS FOR ALL POLLUTANTS S4101850
C-----SEE VPARS ARRAY IN PROGRAM REEDM FOR SPECIES %. S4101860
XXX=1000.0*22.4*1013.2*TEMP(1)/(273.16*PRESS(1)) S4101870
DO 20 I=1,3 S4101880
20 QCONV(I)=(XXX/WTMOL(I))*VPAR(I+12) S4101890
QCONV(4)=1000.0*VPAR(16) S4101900
IF(IRUN .EQ. 4) WRITE(IOU,9011) S4101910
C-----INITIALIZE PARAMETERS FOR BOUNDARY LAYERS. S4101920
ILK=1 S4101930
IF(CALHT.GT.ALT(LAYTOP(1)+1)) ILK=2 S4101940
JF=NLAYS+ILK S4101950
IBOT=LAYBOT(ILK) S4101960
ITOP=LAYTOP(ILK) S4101970
YT = DIRN(JF)+180.0 S4101980
IF(YT .GT. 360.0) YT = YT - 360.0 S4101990
ZBSL=0.0 S4102000
IF(IBOT.GT.1) ZBSL = ALT(IBOT) S4102010
ZTPL = ALT(ITOP+1) S4102020
ZTPAL = ZTPL S4102030
IF(LAYTOP(ILK+1) .GT. 0) ZTPAL = ALT(LAYTOP(ILK+1)+1) S4102040
IF(GRVSET) CALL SHEAR(UBARNK,PHIS,SIGAPK,SIGEPK,1) S4102050

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C
C      CHECK SEGMENT ENTRY POINT.
C
30  IER = 0
    JER = 0
    IF(.NOT.BATCH) GOTO 40
    IDMY = IBLNK
    READ(IIU,9002) IDMY
    GOTO 50
40  WRITE(ICU,9014) INVNDR,INV,OFF,(ULINE,OFF,I=1,2)
    CALL IFNBR(IFRMT,12,IER,IIU)
    IDMY = IFRMT(1)
    IF(IDMY.EQ.MINUS9) GOTO 520
    IF (IDMY .NE. MINUS1) GO TO 50
    JER = JER+1
    IF (JER .GT. 1) GO TO 510
    WRITE (ICU,9022)
    GO TO 40
50  IF(IDMY.EQ.INJ.OR.IDMY.EQ.INOJ) GOTO 500
    IF(IDMY.EQ.IBLNK.OR.IDMY.EQ.IYSJ.OR.IDMY.EQ.IYESJ) GOTO 70
    IF(IER.EQ.0) GO TO 60
    WRITE (ICU,9001) INV,OFF,23,0
    IF (BATCH) GO TO 510
    GO TO 40
60  CONTINUE
C      READ FROM LU IDMY
    IBATCH = .TRUE.
    IIUTMP = IIU
    CALL CODE(2)
    READ(IDMY,*) IIU
    WRITE(ICU,9012) IESCAJ
C
C-----BEGIN DISCRETE RECEPTOR CALCULATIONS.
C
70  QCONV(4) = 1000.0*VPAR(16)
    JER = 0
    CLCHTS = CALHT
    CALHT = 0.0
    NXS = 0
    LINEP = 100
    LINED = 100
    DO 80 I = 1,3
    CDAMXS(I) = 0.0
    YYMAX(I) = 0.0
80  KKMAX(I) = 1
90  CONTINUE
    DO 100 I = 1,10
100 IFRMT(15+I) = IBLNK
    IF(.NOT.BATCH .AND. .NOT.IBATCH) GOTO 120
    IF(NXS .GT. 59) GOTO 400
    ERR = EXEC(1,IIU,IFRMT,-80)
    IF(IER(2) .LE. 0) GOTO 400

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S4102060
S4102070
S4102080
S4102090
S4102100
S4102110
S4102120
S4102130
S4102140
S4102150
S4102160
S4102170
S4102180
S4102190
S4102200
S4102210
S4102220
S4102230
S4102240
S4102250
S4102260
S4102270
S4102280
S4102290
S4102300
S4102310
S4102320
S4102330
S4102340
S4102350
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S4102440
S4102450
S4102460
S4102470
S4102480
S4102490
S4102500
S4102510
S4102520
S4102530
S4102540
S4102550
S4102560
S4102570

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CALL IFNBR(IFRMT,-26,IER,IIU)	S4102580
IF (IER .EQ. 0) GO TO 110	S4102590
WRITE (ICU,9001) INV,OFF,23,1	S4102600
GO TO 90	S4102610
110 CALL CODE(30)	S4102620
READ(IFRMT,*) XT,YT,CALHT	S4102630
IF(XT .LT. 0.0) GOTO 400	S4102640
GOTO 240	S4102650
120 WRITE(ICU,9015) CURSUP,CLRDSP	S4102660
130 CALL IFNBR(IFRMT,26,IER,IIU)	S4102670
IF (IER .EQ. 0) GO TO 140	S4102680
WRITE (ICU,9001) INV,OFF,23,1	S4102690
WRITE (ICU,9015) IBLNK,IBLNK	S4102700
GO TO 130	S4102710
140 CALL CODE(80)	S4102720
READ (IFRMT,*) XT,YT,CALHT	S4102730
IF (XT .EQ. MINS1) GO TO 150	S4102740
IF (XT .EQ. MINS9) GO TO 520	S4102750
GO TO 160	S4102760
150 WRITE(ICU,9012) IESCAJ,IESCAJ	S4102770
GOTO 30	S4102780
C CHECK FOR VALID CALCULATION HEIGHT.	S4102790
160 IF(ALT(LAYTOP(2)).GT.0.0 .AND. CALHT.GT.ALT(LAYTOP(2))) GOTO 170	S4102800
IF(ALT(LAYTOP(2)).EQ.0.0 .AND. CALHT.GT.ALT(LAYTOP(1))) GOTO 170	S4102810
IF(GRVSET .AND. (CALHT .GT. 5.0)) GOTO 220	S4102820
GOTO 230	S4102830
170 WRITE(ICU,9016) CALHT	S4102840
CALL IFNBR(IFRMT,14,IER,IIU)	S4102850
IF (IER .EQ. 0) GO TO 190	S4102860
180 WRITE (ICU,9001) INV,OFF,0,0	S4102870
GO TO 170	S4102880
190 CALL CODE(80)	S4102890
READ (IFRMT,*) CALHT	S4102900
IF (CALHT .EQ. MINS1) GO TO 210	S4102910
IF (CALHT .EQ. MINS9) GO TO 520	S4102920
IF (CALHT .GE. 0.0) GO TO 200	S4102930
GO TO 180	S4102940
200 WRITE(ICU,9013) CURSUP,CURLFT,CLRDSP	S4102950
GO TO 160	S4102960
210 WRITE(ICU,9012) IESCAJ	S4102970
GOTO 90	S4102980
220 WRITE(ICU,9017) CALHT,INV,OFF,INVNDR,INV,OFF	S4102990
IDMY = IBLNK	S4103000
READ(IIU,9002) IDMY	S4103010
WRITE(ICU,9013) (CURSUP,CURLFT,CLRDSP,I=1,4)	S4103020
C WRITE BLANK LINE.	S4103030
WRITE(ICU,9002) IBLNK	S4103040
IF(IDMY .EQ. MINUS9) GOTO 520	S4103050
IF(IDMY.EQ.IYSJ.OR.IDMY.EQ.IYESJ) GO TO 230	S4103060
IF(IDMY.EQ.IBLNK.OR.IDMY.EQ.INJ.OR.IDMY.EQ.INOJ) GO TO 90	S4103070
WRITE (ICU,9001) INV,OFF,0,0	S4103080
GO TO 220	S4103090

230	WRITE(ICU,9013) (CURSUP,CURLFT,CLRDSP,I=1,2)	S4103100
C	GET MAJOR BOUNDARY LAYER.	S4103110
240	JF = NLAYS + 1	S4103120
	IF(CALHT .GE. ALT(LAYTOP(1))) JF = JF + 1	S4103130
C	MAKE 3 CALCULATIONS PER DISCRETE RECEPTOR.	S4103140
	YT1 = YT - 10.0	S4103150
	IF(YT1 .LE. 0.0) YT1 = YT1 + 360.0	S4103160
	NXS = NXs + 1	S4103170
	DISBUF(1,NXS) = XT	S4103180
	DISBUF(2,NXS) = YT1	S4103190
	DISBUF(3,NXS) = CALHT	S4103200
	DO 250 J = 1,10	S4103210
250	IDDISR(J,NXS) = IFRMT(15+J)	S4103220
	DO 260 J = 1,3	S4103230
	CALL BREAK(JF,XT,YT1,NXS,.TRUE.,CDHOLD(1,J),PHIS,UBARNK,	S4103240
1	CLDDTM(1,J,NXS),SIGAPK,SIGEPK)	S4103250
	YT1 = YT1 + 10.0	S4103260
	IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4103270
260	CONTINUE	S4103280
C	SAVE RESULTS IN BUFFER.	S4103290
	L = 3	S4103300
	DO 280 J = 1,3	S4103310
	DO 270 K = 1,4	S4103320
270	DISBUF(L+K,NXS) = CDHOLD(K,J)	S4103330
280	L = L + 4	S4103340
	IF(BATCH) GOTO 320	S4103350
C	DISPLAY DISCRETE RECEPTOR RESULTS.	S4103360
	IF(LINED .LT. 22) GOTO 290	S4103370
	LINED = 5	S4103380
	WRITE(ICU,9009) TIMIN	S4103390
290	CONTINUE	S4103400
	LINED = LINED + 3	S4103410
	WRITE(ICU,9018) XT,YT,CALHT,CDHOLD(4,2),CLDDTM(1,2,NXS)	S4103420
	DO 310 JJ = 1,4	S4103430
	IP = IPLLNT(JJ)	S4103440
	IF(IP .EQ. 0) GOTO 310	S4103450
	L = 0	S4103460
	IF(IP .EQ. 4) L = 4	S4103470
	KDX = IP*3 - 3	S4103480
	K = 0	S4103490
	DO 300 I = 1,3	S4103500
	DO 300 J = 1,3	S4103510
	K = K + 1	S4103520
300	CDOUT(K) = CDHOLD(I+L,J)*QCONV(IP)	S4103530
	LINED = LINED + 2	S4103540
	WRITE(ICU,9019) INV,(IPL(KDX+J),J=1,3),OFF,CDOUT	S4103550
310	CONTINUE	S4103560
C	PRINT DISCRETE RECEPTOR RESULTS FOR AL203.	S4103570
320	CONTINUE	S4103580
	DO 360 JJ = 1,4	S4103590
	IF(IPLLNT(JJ) .NE. 4) GOTO 360	S4103600
	IF(LINEP .LT. 53) GOTO 330	S4103610

LINEP = 27	
WRITE(IOU,9003) IVERSN,LOCATN,MDLNAM	S4103620
WRITE(IOU,9004) (IPL(9+J),J=1,3),TITLE,ZBSL,ZTPAL,	S4103630
1 ISTEIME,LSDT,ISDAY,ISMON,ISYEAR,LTIME,LSDT,LDAY,LMON,LYEAR,	S4103640
2 JTIME,LSDT,JDAY,JMON,JYEAR	S4103650
WRITE(IOU,9005) TIMIN	S4103660
WRITE(IOU,9007)	S4103670
330 CONTINUE	S4103680
YT1 = DISBUF(2,NXS)	S4103690
DO 360 J = 1,3	S4103700
DO 340 I = 1,3	S4103710
CDOUT(I) = CDHOLD(I+4,J)*QCONV(4)	S4103720
IF(CDOUT(I) .LT. CDAMXS(I)) GOTO 340	S4103730
CDAMXS(I) = CDOUT(I)	S4103740
YYMAX(I) = YT1	S4103750
KKMAX(I) = NXs	S4103760
340 CONTINUE	S4103770
IF(CDOUT(1).LT.0.0005 .AND. CDOUT(2).LT.0.005 .AND.	S4103780
1 CDOUT(3).LT.0.0005) GOTO 350	S4103790
LINEP = LINEP + 1	S4103800
IF (J.NE.2) WRITE(IOU,9008) XT,YT1,CALHT,(CDOUT(I),I=1,3),	S4103810
1 CDHOLD(8,J),CLDDTM(2,J,NXS),(IBLNK,I=1,10)	S4103820
IF (J.EQ.2) WRITE(IOU,9008) XT,YT1,CALHT,(CDOUT(I),I=1,3),	S4103830
1 CDHOLD(8,J),CLDDTM(2,J,NXS),(IDDISR(I,NXS),I=1,10)	S4103840
350 YT1 = YT1 + 10.0	S4103850
IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4103860
360 CONTINUE	S4103870
IF(BATCH) GOTO 90	S4103880
IF(NXS .LT. 60) GOTO 370	S4103890
WRITE(ICU,9020)	S4103900
GOTO 400	S4103910
370 IF(IBATCH) GOTO 90	S4103920
WRITE(ICU,9021) INVNDR,INV,OFF,ULINE,OFF	S4103930
IDMY = IBLNK	S4103940
READ(IIU,9002) IDMY	S4103950
IF(IDMY .EQ. MINUS9) GOTO 520	S4103960
IF(IDMY .NE. MINUS1) GOTO 380	S4103970
WRITE(ICU,9012) IESCAJ	S4103980
GOTO 30	S4103990
380 IF(IDMY.EQ.IBLNK.OR.IDMY.EQ.IYSJ.OR.IDMY.EQ.IYESJ) GO TO 90	S4104000
IF (IDMY.EQ.INJ.OR.IDMY.EQ.INOJ) GO TO 390	S4104010
WRITE (ICU,9001) INV,OFF,23,2	S4104020
GO TO 370	S4104030
390 WRITE(ICU,9013) CURSUP,CURLFT,CLRDSP	S4104040
C WRITE BLANK LINE.	S4104050
WRITE(ICU,9002) IBLNK	S4104060
C PRINT DISCRETE RECEPTOR RESULTS (AL203 EXCEPT MAX. HAS BEEN	S4104070
C PRINTED).	S4104080
400 CONTINUE	S4104090
IF(.NOT.IBATCH) GOTO 410	S4104100
IIU = IIUTMP	S4104110
WRITE(ICU,9002) IBLNK	S4104120
	S4104130

410 DO 420 JJ = 1,4	S4104140
IF(IPLLNT(JJ) .NE. 4) GOTO 420	S4104150
WRITE(IOU,9010) (CDAMXS(I),DISBUF(1,KKMAX(I)),YYMAX(I),I=1,2),	S4104160
1 CDAMXS(3),TIMIN,DISBUF(1,KKMAX(3)),YYMAX(3)	S4104170
420 CONTINUE	S4104180
DO 490 JJ = 4,1,-1	S4104190
IP = IPLLNT(JJ)	S4104200
IF(IP .EQ. 0 .OR. IP .EQ. 4) GOTO 490	S4104210
KDX = IP*3 - 3	S4104220
DO 430 J = 1,3	S4104230
KKMAX(J) = 1	S4104240
YYMAX(J) = 0.0	S4104250
430 CDAMXS(J) = 0.0	S4104260
LINEP = 100	S4104270
DO 480 KK=1,NXS	S4104280
IF(LINEP .LT. 53) GOTO 440	S4104290
LINEP = 27	S4104300
WRITE(IOU,9003) IVERSN,LOCATN,MDLNAM	S4104310
WRITE(IOU,9004) (IPL(KDX+J),J=1,3),TITLE,ZBSL,ZTPL,	S4104320
1 ISTEIN,LSDT,ISDAY,ISMON,ISYEAR,LTIME,LSDT,LDAY,LMON,LYEAR,	S4104330
2 JTIME,LSDT,JDAY,JMON,JYEAR	S4104340
WRITE(IOU,9005) TIMIN	S4104350
WRITE(IOU,9006)	S4104360
440 CONTINUE	S4104370
XT = DISBUF(1,KK)	S4104380
YT1 = DISBUF(2,KK)	S4104390
CALHT = DISBUF(3,KK)	S4104400
L = 3	S4104410
DO 470 J = 1,3	S4104420
DO 450 I = 1,3	S4104430
CDOUT(I) = DISBUF(I+L,KK)*QCONV(IP)	S4104440
IF(CDOUT(I) .LT. CDAMXS(I)) GOTO 450	S4104450
CDAMXS(I) = CDOUT(I)	S4104460
YYMAX(I) = YT1	S4104470
KKMAX(I) = KK	S4104480
450 CONTINUE	S4104490
C DON'T PRINT IF VALUES ARE LESS THAN FORMAT ALLOWS.	S4104500
IF(CDOUT(1).LT.0.005 .AND. CDOUT(2).LT.0.005 .AND.	S4104510
1 CDOUT(3).LT.0.0005) GOTO 460	S4104520
LINEP = LINEP + 1	S4104530
IF(J.NE.2) WRITE(IOU,9008) XT,YT1,CALHT,(CDOUT(I),I=1,3),	S4104540
1 DISBUF(L+4,KK),CLDDTM(1,J,KK),(IBLNK,I=1,10)	S4104550
IF(J.EQ.2) WRITE(IOU,9008) XT,YT1,CALHT,(CDOUT(I),I=1,3),	S4104560
1 DISBUF(L+4,KK),CLDDTM(1,J,KK),(IDDISR(I,KK),I=1,10)	S4104570
460 YT1 = YT1 + 10.0	S4104580
IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4104590
470 L = L + 4	S4104600
480 CONTINUE	S4104610
WRITE(IOU,9010) (CDAMXS(I),DISBUF(1,KKMAX(I)),YYMAX(I),I=1,2),	S4104620
1 CDAMXS(3),TIMIN,DISBUF(1,KKMAX(3)),YYMAX(3)	S4104630
490 CONTINUE	S4104640
CALHT = CLCHTS	S4104650

```
500 CONTINUE
    GOTO 530
C-----ERROR EXIT.
510 IERROR(1) = MINS1
    GOTO 530
520 IERROR(1) = 1
530 NNNEST = 1
    NNNTRY = 3
    CALL REEDM
    END
```

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S4104660
S4104670
S4104680
S4104690
S4104700
S4104710
S4104720
S4104730
S4104740
S4104750
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REEDM SOURCE MODULE &RCONN

FTN4	S42000C0
SUBROUTINE BREAK(JF,XO,YO,IXS,DISCRT,BUFDIS,PHIS,UBARNK,CLDTIM,	S42000C10
1 SIGAPK,SIGEPK)	S42000020
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S42000030
C-----	S42000040
C	S42000050
C THIS SUBROUTINE CALCULATES CONCENTRATION,DOSAGE,TIME MEAN CONCEN-	S42000060
C TRATION AT MAXIMUM CENTERLINE OR DISCRETE RECEPTOR LOCATIONS.	S42000070
C	S42000080
C-----	S42000090
Cc	S4200100
C**** BEGIN COMMON AREA ****	S4200110
C 04/02/82	S4200120
C-----MATH PARAMETERS AND CONSTANTS	S4200130
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S4200140
C-----INPUT OPTIONS	S4200150
REAL LAMBDA	S4200160
INTEGER FILE,GOOD,TITLE	S4200170
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S4200180
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S4200190
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S4200200
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S4200210
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S4200220
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S4200230
. ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S4200240
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S4200250
. FS(20),MDLNAM(12),DBAR(20)	S4200260
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S4200270
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S4200280
. MODEL4,MODEL5,MODEL6	S4200290
INTEGER RUNNUM,RT,CL,CS	S4200300
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S4200310
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S4200320
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S4200330
. ,MIXING,MAXDEP,LAYBOT(3)	S4200340
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S4200350
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S4200360
. MINUS1,MINUS9,MIN51,MIN59,	S4200370
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S4200380
. RT(24),TPROPC,IDXRT	S4200390
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S4200400
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S4200410
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S4200420
. CLRLNE,INSLNE,DELNE	S4200430
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S4200440
. INVNDR(2),ULINE(2),	S4200450
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S4200460
. CLRLNE,INSLNE,DELNE,	S4200470
. IESCAJ(3),NULL,IBLNK,	S4200480
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S4200490

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C-----VEHICLE PARAMETERS
COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
RH(30),PTEMP(30),SIGEP(30),SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
SIGYO(29)
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4),QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE (IIU,IPAR(1)), (IOU,IPAR(2)), (IPU1,IPAR(3))
, (IPU2,IPAR(4)), (IPU3,IPAR(5))
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)
C
C**** END OF COMMON AREA ****
C
LOGICAL DISCRT
REAL LAT
C
CD ARRAY = CONC.GAS, DOS.GAS, TIME-MEAN CONC.GAS,
CONC.AL2O3, DOS.AL2O3, TIME-MEAN CONC.AL2O3
C
DIMENSION CD(50,6),YMC DL(3),LMCDL(3),CDMAX(3),YPI(50,2),BUFDIS(1),
1 SIGYI(50,2),NSOURC(2),AVGSY(2),PASTIM(2),CLDTIM(4),CDOUT(6)
DIMENSION RANGE(30,1),BEARNG(30,1),SIGYBR(30,1),
1 VALUES(30,1),PHIS(1),UBARNK(1),SIGAPK(1),SIGEPK(1)
EQUIVALENCE (PLUS,RANGE), (PLUS(181),BEARNG),
1 (PLUS(361),SIGYBR), (PLUS(547),VALUES)
EQUIVALENCE (CDOUT(1),S2GS), (CDOUT(2),S1GS), (CDOUT(3),S3GS),
1 (CDOUT(4),S2AL), (CDOUT(5),S1AL), (CDOUT(6),S3AL)
EQUIVALENCE (NSOURC(1),NSO1), (NSOURC(2),NSO2)
C
DATA NCAT /6/, RAD1 /57.29578/, SQR2P /2.5066283/, RAD/.01745329/
*, TWOPI/6.283185/, TIMI/.016666667/
C
C*** INITIALIZE.
C
XOP = XO

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IF (XOP .EQ. 0.0) XOP = 5.0	S4201020
LOOP = 0	S4201030
10 CONTINUE	S4201040
AVGSY(1) = 0.0	S4201050
AVGSY(2) = 0.0	S4201060
NSGYGS = 0	S4201070
NSGYAL = 0	S4201080
TIMALG = 1.E20	S4201090
TIMALA = 1.E20	S4201100
TIMDLG = 0.0	S4201110
TIMDLA = 0.0	S4201120
NSO1 = 0	S4201130
NSOGS = 0	S4201140
NSO2 = 0	S4201150
DO 30 M = 1,50	S4201160
DO 20 J = 1,NCAT	S4201170
20 CD(M,J) = 0.0	S4201180
DO 30 J = 1,2	S4201190
SIGYI(M,J) = 0.0	S4201200
30 YPI(M,J) = 0.0	S4201210
C	S4201220
C*** BEGIN LOOP OVER MAJOR BOUNDARY LAYERS.	S4201230
C	S4201240
NILK = 0	S4201250
DO 330 ILK = 1,2	S4201260
IF(ILK .EQ. 1) GOTO 40	S4201270
IF(.NOT.GRVSET) GOTO 330	S4201280
IF(LAYTOP(NLK+1) .EQ. 0) GOTO 330	S4201290
IBOT = LAYTOP(NLK) + 1	S4201300
ITOP = LAYTOP(NLK+1)	S4201310
JF = NLAYS + NLK + 1	S4201320
GOTO 50	S4201330
40 CONTINUE	S4201340
NLK = 1	S4201350
IF(CALHT .GT. ALT(LAYTOP(1))) NLK = 2	S4201360
JF = NLAYS + NLK	S4201370
IBOT = LAYBOT(NLK)	S4201380
ITOP = LAYTOP(NLK)	S4201390
ZBL = ALT(IBOT)	S4201400
IF(DISCRT .OR. LOOP.GT.0) GOTO 50	S4201410
YO = DIRN(JF) + 180.0	S4201420
IF(YO .GT. 360.0) YO = YO - 360.0	S4201430
50 CONTINUE	S4201440
NILK = NILK + 1	S4201450
SPEEDI = 1./SPEEDN(JF)	S4201460
ZTLZBL = ALT(ITOP+1) - ZBL	S4201470
IF(IRUN.EQ.4) WRITE(10U,9001) XO,YO ,ILK,CALHT,ZBL,ZTLZBL	S4201480
9001 FORMAT(/35H DIAGNOSTICS FOR DOWNWIND LOCATION ,2F10.2/I6,3E13.6)	S4201490
C	S4201500
C*** BEGIN LOOP OVER METEOROLOGICAL LAYERS.	S4201510
C	S4201520
DO 320 M = IBOT,ITOP	S4201530

IFL = 1	S4201540
IFAL = 1	S4201550
IF (.NOT.GRVSET) IFAL = 0	S4201560
SIGXAL = 0.0	S4201570
SIAL = 0.0	S4201580
S2AL = 0.0	S4201590
S3AL = 0.0	S4201600
S1GS = 0.0	S4201610
S2GS = 0.0	S4201620
S3GS = 0.0	S4201630
IF(IRUN .EQ. 4) WRITE(10U,9002) M	S4201640
9002 FORMAT(19H0*** FOR MET. LAYER,I3)	S4201650
C	S4201660
C** COMPUTE XBAR & YBAR OF SOURCE M WITH RESPECT TO BOUNDARY LAYER	S4201670
C** WIND DIRECTION (DIRN(JF)) FOR GAS.	S4201680
C	S4201690
A1 = DIRN(JF)*RAD	S4201700
CALL COORD(A1,M,XO,YO ,XS,YS,X,Y)	S4201710
IF(IFLG.GE.0) GO TO 60	S4201720
IFL = 0	S4201730
60 CONTINUE	S4201740
IF (.NOT.GRVSET) GO TO 90	S4201750
C	S4201760
C** ADJUST XBAR & YBAR DUE TO GRAVITATIONAL SETTLING FOR AL203.	S4201770
C** COMPUTE SIGMAS USING ADJUSTED XBAR.	S4201780
C** COMPUTE FRONT-END TERMS FOR AL203.	S4201790
C	S4201800
IF(.NOT.(DISCRT .OR. LOOP.GT.0)) GOTO 70	S4201810
A1 = DIRN(M)*RAD+PHIS(M)	S4201820
CALL COORD(A1,M,XO,YO ,XS,YS,XAL,YAL)	S4201830
IF (IFLG .GE. 0) GO TO 80	S4201840
IFAL = 0	S4201850
GO TO 80	S4201860
70 PHISM = (DIRN(M)+180.0)*RAD + PHIS(M)	S4201870
IF(PHISM .GT. TWOPI) PHISM = PHISM - TWOPI	S4201880
IF(PHISM .LE. 0.0) PHISM = PHISM + TWOPI	S4201890
THETC = DY(M)*RAD	S4201900
SR = ABS(PHISM - THETC)	S4201910
IF (SR .GT. PI) SR = TWOPI-SR	S4201920
SR = ABS(PI-SR)	S4201930
A1 = DX(M)	S4201940
SS = PI - (SR + ARSIN(A1*SIN(SR)/XOP))	S4201950
XAL = A1*A1 + XO*XO - 2.0*A1*XO*COS(SS)	S4201960
IF(XAL .LE. 0.0) IFAL = 0	S4201970
XAL = ABS(XAL)	S4201980
XAL = SQRT(XAL)	S4201990
SK = 1.0	S4202000
IF(ABS(PHISM - THETC) .GT. PI) SK = -1.0	S4202010
IF(PHISM .LT. THETC) SK = -1.0*SK	S4202020
YAL = THETC + SK*SS	S4202030
IF(YAL .LE. 0.0) YAL = YAL + TWOPI	S4202040
IF(YAL .GT. TWOPI) YAL = YAL - TWOPI	S4202050

	80 CONTINUE	S4202060
C	COMPUTE SIGMAS FOR AL203	S4202070
	IF (IFAL .EQ. 0) GO TO 90	S4202080
	CALL SIGMA(XAL,M,JF,1,SIGAPK(M),SIGEPK(M),PHIS(M)*RADI)	S4202090
	SIGXAL = SIGXNK	S4202100
	IF(SIGYNK .LE. 0.0) GOTO 90	S4202110
	SIGYAL = SIGYNK	S4202120
	IF(SIGZ .LE. 0.0) GOTO 90	S4202130
	SIGZAL = SIGZ	S4202140
	UBRIAL = 1./UBARNK(M)	S4202150
C	COMPUTE FRONT-END TERMS FOR AL203	S4202160
	SIAL = Q(M)*UBRIAL/(2.0*SQR2P*SIGYAL*(ALT(M+1)-ALT(M)))	S4202170
	IF(DECAY .GT. 0.0) SIAL = SIAL*EXP(-DECAY*XAL*UBRIAL)	S4202180
	IF(SIGXAL .GT. 0.0) S2AL = SIAL*UBARNK(M)/((SQR2P*SIGXAL)	S4202190
	IF(DISCRT .OR. LOOP.GT.0) ALATAL = YAL/SIGYNK	S4202200
C		S4202210
C**	COMPUTE SIGMAS AND FRONT-END TERMS FOR GASES.	S4202220
C		S4202230
	90 CONTINUE	S4202240
	IF (IFL .EQ. 0.AND.IFAL .EQ. 0) GO TO 280	S4202250
	IF(LOOP .GT. 0.OR.IFL .EQ. 0) GOTO 100	S4202260
	CALL SIGMA(X,M,JF,0,SIGAPN(M),SIGEPN(M),DDIR(M))	S4202270
	IF(SIGYNK .LE. 0.0) GOTO 100	S4202280
	UBRIGS = 1./SPEEDN(M)	S4202290
	SIGS = Q(M)/(SPEEDN(JF)*2.0*SQR2P*SIGYNK*(ALT(M+1)-ALT(M)))	S4202300
	IF(DECAY .GT. 0.0) SIGS = SIGS*EXP(-DECAY*X/SPEEDN(JF))	S4202310
	IF(SIGXNK .GT. 0.0) S2GS = SIGS*SPEEDN(JF)/((SQR2P*SIGXNK)	S4202320
	IF(DISCRT) ALATGS = Y/SIGYNK	S4202330
C		S4202340
	100 IF(Q(M) .LE. 0.0) GOTO 260	S4202350
C		S4202360
C**	BEGIN LOOP OVER GRAVITATIONAL SETTLING CATEGORIES.	S4202370
C**	CALCULATE VERTICAL TERM.	S4202380
C		S4202390
	VSXSUI = 0.0	S4202400
	VERTGS = 0.0	S4202410
	VERTAL = 0.0	S4202420
C	ABSORPTION COEFFICIENT FOR CASES IN GAMMAP(21)	S4202430
	GAMMA = 1.0 - GAMMAP(21)	S4202440
C	CHECK VERTICAL TERM VARIABLES. SKIP GAS, AL203 OR BOTH.	S4202450
	J0 = 0	S4202460
	J1 = NVS	S4202470
	IF(SIGZ.LE.0.0 .OR. LOOP.GT.0.OR.IFL .EQ. 0) J0 = 1	S4202480
	IF(.NOT.GRVSET.OR.SIGZAL.LE.0.0.OR.XAL.LE.0.0.OR.IFAL.EQ.0)J1=0	S4202490
	IF(J0 .GT. J1) GOTO 260	S4202500
	DO 170 J = J0,J1	S4202510
	IF(J .EQ. 0) GOTO 110	S4202520
	SIGZ = SIGZAL	S4202530
	VSXSUI = VS(J)*XAL*UBRIAL	S4202540
	GAMMA = GAMMAP(J)	S4202550
	110 CONTINUE	S4202560
	120 CONTINUE	S4202570

C	1./SQRT(2) = .70710678	
	SIGZI = .70710678/SIGZ	S4202580
	A1 = (-ALT(M) + CALHT + VSXSUI)*SIGZI	S4202590
	A2 = -(ALT(M+1) - CALHT - VSXSUI)*SIGZI	S4202600
	A3 = ERFXS(A1,A2)	S4202610
	A4 = (-ZBL - ZBL + ALT(M+1) + CALHT - VSXSUI)*SIGZI	S4202620
	A5 = -(ZBL + ZBL - ALT(M) - CALHT + VSXSUI)*SIGZI	S4202630
	A6 = ERFXS(A4,A5)	S4202640
	A6 = GAMMA*A6	S4202650
	SUM = A3 + A6	S4202660
	SUML = -1.0	S4202670
	GAM1 = 1.0	S4202680
	GAM2 = GAMMA	S4202690
	GAM3 = GAM2*GAMMA	S4202700
	AI = 0.0	S4202710
C*	BEGIN SUMMATION LOOP FOR VERTICAL TERM.	S4202720
130	AI = AI + 2.0	S4202730
	A10 = (AI*ZTLZBL + ZBL + ZBL - ALT(M) - CALHT + VSXSUI)*SIGZI	S4202740
	A11 = -(-AI*ZTLZBL - ZBL - ZBL + ALT(M+1) + CALHT - VSXSUI)*SIGZI	S4202750
	IF(SUML .LT. 0.0) GOTO 140	S4202760
	IF(A10 .GT. 3.0 .AND. A11 .GT. 3.0) GOTO 150	S4202770
140	CONTINUE	S4202780
	A1 = (AI*ZTLZBL - ALT(M) + CALHT + VSXSUI)*SIGZI	S4202790
	A2 = -(-AI*ZTLZBL + ALT(M+1) - CALHT - VSXSUI)*SIGZI	S4202800
	A3 = ERFXS(A1,A2)	S4202810
	A3 = GAM2*A3	S4202820
	A4 = (AI*ZTLZBL - ZBL - ZBL + ALT(M+1) + CALHT - VSXSUI)*SIGZI	S4202830
	A5 = -(-AI*ZTLZBL + ZBL + ZBL - ALT(M) - CALHT + VSXSUI)*SIGZI	S4202840
	A6 = ERFXS(A4,A5)	S4202850
	A6 = GAM3*A6	S4202860
	A7 = (AI*ZTLZBL + ALT(M+1) - CALHT - VSXSUI)*SIGZI	S4202870
	A8 = -(-AI*ZTLZBL - ALT(M) + CALHT + VSXSUI)*SIGZI	S4202880
	A9 = ERFXS(A7,A8)	S4202890
	A9 = GAM2*A9	S4202900
	A12 = ERFXS(A10,A11)	S4202910
	A12 = GAM1*A12	S4202920
	SUM = SUM + A3 + A6 + A9 + A12	S4202930
	GAM1 = GAM2	S4202940
	GAM2 = GAM3	S4202950
	GAM3 = GAM3*GAMMA	S4202960
	SUML = SUM	S4202970
	GOTO 130	S4202980
C		S4202990
150	CONTINUE	S4203000
	IF(J .GT. 0) GOTO 160	S4203010
	VERTGS = SUM	S4203020
	GOTO 170	S4203030
160	VERTAL = VERTAL + SUM*FS(J)	S4203040
170	CONTINUE	S4203050
C		S4203060
C**	COMPUTE DOSAGE (S1AL & S1GS), CONCENTRATION (S2AL & S2GS) AND	S4203070
C**	TIME-MEAN CONC. (S3AL & S3GS).	S4203080
		S4203090

C	IF (IFAL .EQ. 0) GO TO 180	S4203100
	S1AL = S1AL*VERTAL	S4203110
	S2AL = S2AL*VERTAL	S4203120
180	IF (IFL .EQ. 0) GO TO 190	S4203130
	S1GS = S1GS*VERTGS	S4203140
	S2GS = S2GS*VERTGS	S4203150
190	IF (IFAL .EQ. 0) GO TO 200	S4203160
C	.35355339 = 1./(2*SQRT(2))	S4203170
	A1 = UBARNK(M)*TIMAV*.35355339/SIGXNK	S4203180
	A1 = ERFXS(A1,0.0)	S4203190
	S3AL = S1AL*A1/TIMAV	S4203200
200	IF (IFL .EQ. 0) GO TO 210	S4203210
	A1 = SPEEDN(JF)*TIMAV*.35355339/SIGXNK	S4203220
	A1 = ERFXS(A1,0.0)	S4203230
	S3GS = S1GS*A1/TIMAV	S4203240
C		S4203250
210	IF(.NOT.(DISCRT .OR. LOOP.GT.0)) GOTO 230	S4203260
	ALATAL = -.5*ALATAL*ALATAL	S4203270
	IF(ALATAL .LT. -60.0) GOTO 220	S4203280
	ALATAL = EXP(ALATAL)	S4203290
	S1AL = S1AL*ALATAL	S4203300
	S2AL = S2AL*ALATAL	S4203310
	S3AL = S3AL*ALATAL	S4203320
220	IF(LOOP .GT. 0) GOTO 230	S4203330
	ALATGS = -.5*ALATGS*ALATGS	S4203340
	IF(ALATGS .LT. -60.0) GOTO 230	S4203350
	ALATGS = EXP(ALATGS)	S4203360
	S1GS = S1GS*ALATGS	S4203370
	S2GS = S2GS*ALATGS	S4203380
	S3GS = S3GS*ALATGS	S4203390
230	CONTINUE	S4203400
	IF(SIGYAL .LE. 0.0.OR. IFAL .EQ. 0) GOTO 240	S4203410
	AVGSY(2) = AVGSY(2) + SIGYAL	S4203420
	NSGYAL = NSGYAL + 1	S4203430
240	IF(SIGYNK.LE.0.0 .OR. LOOP.GT.0.OR. IFL .EQ. 0) GOTO 250	S4203440
	AVGSY(1) = AVGSY(1) + SIGYNK	S4203450
	NSGYGS = NSGYGS + 1	S4203460
250	CONTINUE	S4203470
C	COMPUTE CLOUD ARRIVAL & DEPARTURE TIMES FOR THIS MET. LAYER.	S4203480
C	NOTE: NEGATIVE XBAR ("X") IS VALID.	S4203490
260	IF (IFL .EQ. 0.OR. ILK .GT. 1) GO TO 270	S4203500
	TIMAKG = (X-2.15*SIGXNK)*UBRIGS+RISTIM(M)	S4203510
	TIMDKG = (X+2.15*SIGXNK)*UBRIGS+RISTIM(M)	S4203520
	TIMALG = AMIN1(TIMALG,TIMAKG)	S4203530
	TIMDLG = AMAX1(TIMDLG,TIMDKG)	S4203540
270	IF (IFAL .EQ. 0) GO TO 280	S4203550
	TIMAKA = (XAL-2.15*SIGXAL)*UBRIAL+RISTIM(M)	S4203560
	TIMDKA = (XAL+2.15*SIGXAL)*UBRIAL+RISTIM(M)	S4203570
	TIMALA = AMIN1(TIMALA,TIMAKA)	S4203580
	TIMDLA = AMAX1(TIMDLA,TIMDKA)	S4203590
C		S4203600
		S4203610

280 IF(IRUN .EQ. 4) WRITE(10U,9003) JF,LOOP,DISCRT,ALT(M),ALT(M+1),	S4203620
1 Q(M),SPEEDN(M),SPEEDN(JF),UBARNK(M),	S4203630
2 SIGXAL,SIGXNK,SIGYAL,SIGYNK,SIGZAL,SIGZ,	S4203640
3 VERTAL,VERTGS,ALATAL,ALATGS,	S4203650
4 TIMAKA,TIMDKA,TIMAKG,TIMDKG,XAL,X,YAL,Y,	S4203660
5 CDOUT	S4203670
9003 FORMAT(S4203680
1 39H JF,LOOP,DISCRT,ALT(M),ALT(M+1),Q(M) =,2I5,L5,1P3E14.5/	S4203690
2 34H SPEEDN(M),SPEEDN(JF),UBARNK(M) =,3E14.5/	S4203700
3 43H SIGXAL,SIGXNK,SIGYAL,SIGYNK,SIGZAL,SIGZ =,6E14.5/	S4203710
4 31H VERTAL,VERTGS,ALATAL,ALATGS =,4E14.5/	S4203720
5 31H TIMAKA,TIMDKA,TIMAKG,TIMDKG =,4E14.5/	S4203730
6 15H XAL,X,YAL,Y =,4E14.5/	S4203740
7 11H CONC.GAS=,E12.6,9H DOS.GAS=,E12.6,20H TIME-MEAN CONC.GAS=,	S4203750
8E12.6/13H CONC.AL2O3=,E12.6,11H DOS.AL2O3=,E12.6,21H TIME-MEAN CONS	S4203760
9C.AL2O3=,E12.6)	S4203770
C LOAD GOOD RESULTS IN ARRAYS.	S4203780
IF(ILK .GT. 1) GOTO 300	S4203790
IF(S1GS.LE.0.0 .OR. LOOP.GT.0) GOTO 300	S4203800
NSOGS = NSOGS+1	S4203810
DO 290 J = 1,3	S4203820
290 CD(NSOGS,J) = CDOUT(J)	S4203830
SIGYI(NSOGS,1) = SIGYNK	S4203840
YPI(NSOGS,1) = Y	S4203850
300 IF(S1AL .LE. 0.0) GOTO 320	S4203860
IF (ILK .EQ. 1) NSO1 = NSO1+1	S4203870
NSO2 = NSO2 + 1	S4203880
DO 310 J = 4,6	S4203890
310 CD(NSO2,J) = CDOUT(J)	S4203900
SIGYI(NSO2,2) = SIGYAL	S4203910
YPI(NSO2,2) = YAL	S4203920
320 CONTINUE	S4203930
C	S4203940
C* END MET. LAYER LOOP.	S4203950
C	S4203960
IF(ILK .GT. 1) GOTO 330	S4203970
PASTIM(1) = AMAX1(TIMALG*TIMI,0.0)	S4203980
PASTIM(2) = TIMDLG*TIMI	S4203990
330 CONTINUE	S4204000
C	S4204010
C** END OF MAJOR BOUNDARY LAYERS.	S4204020
C	S4204030
IF(NILK .NE. 1) GOTO 340	S4204040
AVGSY(2) = AVGSY(1)	S4204050
NSGYAL = NSGYGS	S4204060
340 IF(.NOT.DISCRT) GOTO 390	S4204070
C* DISCRETE RECEPTOR. STORE RESULTS INTO BUFDIS ARRAY.	S4204080
C* LOCATION 1 = CONC.GAS, 2 = DOS.GAS, 3 = TIME-MEAN CONC.GAS,	S4204090
C* 4 = CLOUD ARRIVAL TIME.GAS, 5 = CONC.AL2O3, 6 = DOS.AL2O3,	S4204100
C* 7 = TIME-MEAN CONC.AL2O3, 8 = CLOUD ARRIVAL TIME.AL2O3	S4204110
C	S4204120
DO 350 III = 1,8	S4204130

350	BUFDIS(III) = 0.0	S4204140
	BUFDIS(4) = PASTIM(1)	S4204150
	BUFDIS(8) = AMAX1(TIMALA*TIMI,0.0)	S4204160
	CLDTIM(1) = PASTIM(2)	S4204170
	CLDTIM(2) = TIMDLA*TIMI	S4204180
	IF(NSOGS.EQ. 0) GOTO 370	S4204190
C	STORE GAS RESULTS.	S4204200
	DO 360 III = 1,NSOGS	S4204210
	DO 360 J = 1,3	S4204220
360	BUFDIS(J) = BUFDIS(J) + CD(III,J)	S4204230
370	IF(NSO2 .EQ. 0) GOTO 490	S4204240
C	STORE AL203 RESULTS.	S4204250
	DO 380 III = 1,NSO2	S4204260
	DO 380 J = 5,7	S4204270
380	BUFDIS(J) = BUFDIS(J) + CD(III,J-1)	S4204280
	GOTO 490	S4204290
390	CONTINUE	S4204300
	IF(LOOP .NE. 0) GOTO 410	S4204310
C*	MAXIMUM CENTERLINE. CALL CHIR TO FIND LOCATION & VALUE OF	S4204320
C*	MAXIMUM GAS RESULTS.	S4204330
	CALL CHIR(CD,YPI,SIGYI,NSOGS,CDMAX,YMCDL)	S4204340
C*	SAVE MAXIMUM VALUE & LOCATION IN ARRAYS.	S4204350
	DO 400 J = 1,3	S4204360
	IF(CDMAX(J) .LE. 0.0) GOTO 400	S4204370
	A1 = YMCDL(J)	S4204380
	RANGE(IXS,J) = SQRT(XO*XO+A1*A1)	S4204390
C	RADI CONVERTS RADIANS TO DEGREES.	S4204400
	A1 = YO + ATAN2(A1,XOP)*RADI	S4204410
	IF(A1 .GT. 360.0) A1 = A1 - 360.0	S4204420
	IF(A1 .LE. 0.0) A1 = A1 + 360.0	S4204430
	BEARNG(IXS,J) = A1	S4204440
	VALUES(IXS,J) = CDMAX(J)	S4204450
	SIGYBR(IXS,J) = AVGSY(1)/NSGYGS	S4204460
400	CONTINUE	S4204470
	CLDTIM(1) = PASTIM(1)	S4204480
	CLDTIM(2) = PASTIM(2)	S4204490
410	IF(.NOT.GRVSET) GOTO 490	S4204500
	IF(LOOP .NE. 0) GOTO 430	S4204510
C*	COMPUTE MAXIMUM VALUE OVER BOUNDARY LAYER AND "HIDDEN" BOUNDARY	S4204520
C	FOR AL203 VALUES.	S4204530
	CALL CROSS(YPI(1,2),NSO2)	S4204540
	DO 420 I = 1,NSO2	S4204550
420	YPI(I,2) = YPI(I,2)*XO	S4204560
	CALL CHIR(CD(1,4),YPI(1,2),SIGYI(1,2),NSO2,CDMAX,YMCDL)	S4204570
C*	LOOP-BACK LOGIC. GO BACK AND CALCULATE EXACT AL203 RESULTS	S4204580
C*	AT MAXIMUM LOCATION (YMCDL(1)).	S4204590
	LOOP = 1	S4204600
	YO = YMCDL(1)/XOP*RADI	S4204610
	GOTO 10	S4204620
430	J = LOOP + 3	S4204630
C*	SAVE MAXIMUM VALUE & LOCATION IN ARRAYS.	S4204640
440	A1 = 0.0	S4204650

DO 450 I = 1,NS02	
450 A1 = A1 + CD(I,J)	S4204660
IF(A1 .LE. 0.0) GOTO 460	S4204670
RANGE(IXS,J) = XO	S4204680
IF(YO .GT. 360.0) YO = YO - 360.0	S4204690
IF(YO .LE. 0.0) YO = YO + 360.0	S4204700
BEARNG(IXS,J) = YO	S4204710
VALUES(IXS,J) = A1*QCONV(4)	S4204720
SIGYBR(IXS,J) = AVGSY(2)/NSGYAL	S4204730
CLDTIM(3) = AMAX1(TIMALA*TIMI,0.0)	S4204740
CLDTIM(4) = TINDLA*TIMI	S4204750
C* CONTINUE LOOP-BACK LOGIC.	S4204760
460 IF(LOOP .NE. 1) GOTO 470	S4204770
LOOP = 2	S4204780
J = 5	S4204790
IF(ABS(YMCDL(2)-YMCDL(1)) .LT. 1.E-3) GOTO 440	S4204800
J = 6	S4204810
IF(ABS(YMCDL(3)-YMCDL(1)) .LT. 1.E-3) GOTO 440	S4204820
YO = YMCDL(2)/XOP*RADI	S4204830
GOTO 10	S4204840
470 IF(LOOP .NE. 2) GOTO 480	S4204850
LOOP = 3	S4204860
J = 6	S4204870
IF(ABS(YMCDL(3)-YMCDL(2)) .LT. 1.E-3) GOTO 440	S4204880
IF(ABS(YMCDL(3)-YMCDL(1)) .LT. 1.E-3) GOTO 480	S4204890
YO = YMCDL(3)/XOP*RADI	S4204900
GOTO 10	S4204910
480 CONTINUE	S4204920
C	S4204930
C* RETURN	S4204940
C	S4204950
490 CONTINUE	S4204960
IF(IRUN .EQ. 4) WRITE(IOU,9004) NSGYAL,NSGYGS,NSOURC,NSOGS,IXS,	S4204970
1 AVGSY,CLDTIM,(RANGE(IXS,J),J=1,6),	S4204980
2 (BEARNG(IXS,J),J=1,6),(VALUES(IXS,J),J=1,6)	S4204990
9004 FORMAT(39H NSGYAL,NSGYGS,NSOURC(1-2),NSOGS,IXS = ,6I5/	S4205000
1 26H AVGSY(1-2),CLDTIM(1-4) = ,6E12.6/12H RANGE(1-6)=,6E14.7/	S4205010
2 14H BEARNG(1-6) =,6E14.7/14H VALUES(1-6) =,6E14.7)	S4205020
RETURN	S4205030
END	S4205040
	S4205050

	SUBROUTINE CHIR(CD,YPI,SIGYI,NSOURC,CDMAX,YMCDL)	S4300000
	. , UPDATE: 8213 SOURCE: 16 DEC 81 LOCATION: KSC	S4300010
C	-----	S4300020
C		S4300030
C	THIS SUBROUTINE CALCULATES THE MAXIMUM CENTERLINE	S4300040
C	CONCENTRATION AND DOSAGE ALONG THE YBAR AXIS.	S4300050
C	-----	S4300060
C		S4300070
C	DIMENSION CD(50,1),SIGYI(1),YPI(1),CDMAX(3),YMCDL(3),YCHI(3)	S4300080
	DATA NCAT /3/	S4300090
C		S4300100
	DO 10 I = 1,NCAT	S4300110
10	CDMAX(I) = 0.0	S4300120
	IF(NSOURC.EQ.1) GO TO 40	S4300130
	DO 30 I=1,NSOURC-1	S4300140
	DO 30 J=I+1,NSOURC	S4300150
	IF(YPI(I).GT.YPI(J)) GO TO 30	S4300160
	TMP1=YPI(I)	S4300170
	YPI(I)=YPI(J)	S4300180
	YPI(J)=TMP1	S4300190
	TMP1=SIGYI(I)	S4300200
	SIGYI(I)=SIGYI(J)	S4300210
	SIGYI(J)=TMP1	S4300220
	DO 20 K = 1,NCAT	S4300230
	TMP1 = CD(I,K)	S4300240
	CD(I,K) = CD(J,K)	S4300250
20	CD(J,K) = TMP1	S4300260
30	CONTINUE	S4300270
40	CONTINUE	S4300280
	ISTR=1	S4300290
C	-----CALCULATE THE NUMBER OF SOURCES IN A GROUP	S4300300
	50 SMIN=SIGYI(ISTR)	S4300310
	I=ISTR	S4300320
60	IF(I.GT.NSOURC) GO TO 160	S4300330
	IF(I.EQ.NSOURC) GO TO 70	S4300340
	J=I+1	S4300350
	TMP1=YPI(I)-YPI(J)	S4300360
	TMP2=1.18*(SIGYI(I)+SIGYI(J))	S4300370
	IF(TMP1.GT.TMP2) GO TO 70	S4300380
	I=I+1	S4300390
	GO TO 60	S4300400
70	CONTINUE	S4300410
	SMIN=SIGYI(ISTR)	S4300420
	IF(ISTR.EQ.NSOURC) GO TO 90	S4300430
	IF(ISTR.EQ.I) GO TO 90	S4300440
	DO 80 M=ISTR+1,I	S4300450
80	SMIN=AMIN1(SMIN,SIGYI(M))	S4300460
90	YINC=.08*SMIN	S4300470
	YY=YPI(ISTR)	S4300480
100	DO 110 J = 1,NCAT	S4300490
		S4300500

110 YCHI(J) = 0.0	S4300510
IF(YY.LT.YPI(I)) GO TO 150	S4300520
DO 130 M=1,NSOURC	S4300530
EX=(YY-YPI(M))/SIGYI(M)	S4300540
EX = TEXP(EX)	S4300550
IF(EX .LE. 0.0) GOTO 130	S4300560
DO 120 J = 1,NCAT	S4300570
120 YCHI(J) = YCHI(J) + CD(M,J)*EX	S4300580
130 CONTINUE	S4300590
DO 140 J = 1,NCAT	S4300600
IF(YCHI(J) .LT. CDMAX(J)) GOTO 140	S4300610
CDMAX(J) = YCHI(J)	S4300620
YMCDL(J) = YY	S4300630
140 CONTINUE	S4300640
YY=YY-YINC	S4300650
GO TO 100	S4300660
150 CONTINUE	S4300670
ISTR=I+1	S4300680
GO TO 50	S4300690
160 DO 170 J = 1,NCAT	S4300700
170 IF(CDMAX(J) .LE. 0.0) YMCDL(J) = 0.0	S4300710
RETURN	S4300720
END	S4300730

REEDM SOURCE MODULE &RPDPM

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FTN4
PROGRAM RPDPM(5)
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::S4400010
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::S4400020
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::S4400030
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::S4400040
C::: ::S4400050
C::: ::S4400060
C::: ORGANIZATION: H. E. CRAMER CO., INC. ::S4400070
C::: ::S4400080
C::: WORK FOR: DR. J. B. STEPHENS (ES84) ::S4400090
C::: ::S4400100
C::: PROGRAM CODE: RPDPM ::S4400110
C::: ::S4400120
C::: PROGRAM DESCRIPTION: ::S4400130
C::: THIS PROGRAM CALCULATES THE GROUND-LEVEL DEPOSITION DUE TO ::S4400140
C::: PRECIPITATION SCAVENGING FOR THE MEAN WIND DIRECTION RADIAL AT ::S4400150
C::: EVERY KILOMETER DOWNWIND FROM THE LAUNCH SITE. FOR THE HCL ::S4400160
C::: SPECIES, THE AMOUNT OF ACID IS ALSO COMPUTED. ::S4400170
C::: ::S4400180
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::S4400190
C::::::::::::::::::::::::::::::::::::::::::::::::::::::::::S4400200
C ::S4400210
Cç ::S4400220
C**** BEGIN COMMON AREA ****S4400230
C 04/02/82 S4400240
C-----MATH PARAMETERS AND CONSTANTS S4400250
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S4400260
C-----INPUT OPTIONS S4400270
REAL LAMBDA S4400280
INTEGER FILE,GOOD,TITLE S4400290
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S4400300
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S4400310
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S4400320
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S4400330
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S4400340
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S4400350
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S4400360
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S4400370
. FS(20),MDLNAM(12),DBAR(20) S4400380
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S4400390
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S4400400
. MODEL4,MODEL5,MODEL6 S4400410
INTEGER RUNNUM,RT,CL,CS S4400420
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S4400430
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S4400440
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S4400450
. ,MIXING,MAXDEP,LAYBOT(3) S4400460
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S4400470
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S4400480
. MINUS1,MINUS9,MINSL,MINSL, S4400490

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      .          MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,  S4400500
      .          RT(24),TPROPC,IDXRT                                S4400510
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.      S4400520
      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,                  S4400530
      .          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4400540
      .          CLRLNE,INSLNE,DELIN                               S4400550
      COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),   S4400560
      .          INVNDR(2),ULINE(2),                              S4400570
      .          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4400580
      .          CLRLNE,INSLNE,DELIN,                             S4400590
      .          IESCAJ(3),NULL,IBLNK,                            S4400600
      .          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)         S4400610
C-----VEHICLE PARAMETERS                                          S4400620
      COMMON /VCLPR/ VPAR(17)                                     S4400630
C-----TIME PARAMETERS                                             S4400640
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,   S4400650
      .          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)      S4400660
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)    S4400670
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S4400680
      .          RH(30),PTEMP(30),SIGEP(30),SIGAP(30)             S4400690
C-----LAYER PARAMETERS                                           S4400700
      COMMON /LAYER/ DX,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S4400710
      .          SIGYO(29)                                         S4400720
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)                 S4400730
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)                   S4400740
C-----CALCULATED NEW LAYER PARAMETERS                             S4400750
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S4400760
      .          SPEEDN(32)                                         S4400770
C-----CONVERSION FACTORS                                          S4400780
      COMMON /CNVRT/ QCONV(4),QPDEPH                              S4400790
C                                                                    S4400800
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S4400810
      COMMON /EXTRA/   NCOM(1),   NTOTAL(1),   PLUS(900)           S4400820
C-----READ/WRITE BUFFER                                           S4400830
C-----A R R A Y   =   2077   +   1       +   1       +   2 * 900   =   3879S4400840
C*****S4400850
C                                                                    S4400860
C-----EQUIVALENCE STATEMENTS                                       S4400870
      EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))      S4400880
      .          ,(IPU2,IPAR(4)),(IPU3,IPAR(5))                  S4400890
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)             S4400900
C                                                                    S4400910
C****          E N D   O F   C O M M O N   A R E A                ****S4400920
C¢                                                    S4400930
      LOGICAL IBATCH                                              S4400940
C                                                                    S4400950
      DIMENSION IPL(12),MILK(3),IER(2)                           S4400960
      DIMENSION DISBUF(14,1),MPTDLB(8,2),ZMET(3,2),WDHOLD(4,3),WDOUT(9) S4400970
      DIMENSION RANGE(30,1),BEARNG(30,1),SIGYBR(30,1),VALUES(30,1) S4400980
      1 ,CDAMXS(1),PEAKS(2,1),IDDISR(10,60)                     S4400990
C                                                                    S4401000
      EQUIVALENCE (PLUS,DISBUF,RANGE),(PLUS(181),BEARNG),        S4401010

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1 (PLUS(361),SIGYBR),(PLUS(541),CDAMXS),(PLUS(547),VALUES),	S4401020
2 (PLUS(727),PEAKS), (ERR,IER)	S4401030
C	S4401040
DATA IPL /2H H,2HCL,2H ,2H C,2HO2,2H ,2H C,2HO ,2H ,2HAL,2H2O,	S4401050
1 2H3 /	S4401060
DATA NXS,WTMOL /30,36.46/	S4401070
DATA MILK /2,3,1/	S4401080
DATA MPTDLB /2H T,2HIM,2HE-,2H-D,2HEP,2HEN,2HDE,2HNT,	S4401090
1 2HMA,2HXI,2HMU,2HM ,2HPO,2HSS,2HIB,2HLE/	S4401100
DATA IBATCH /.FALSE./	S4401110
DATA JVERSN/8213/	S4401120
C	S4401130
C	S4401140
IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S4401150
C*** INITIALIZE.	S4401160
JER = 0	S4401170
C	S4401180
IF(IRUN .EQ. 4) WRITE(IOU,9014)	S4401190
C PH CONVERSION FACTOR.	S4401200
QPDEPH = 1.0/(RAINRT*25.4*WTMOL*DURAT)	S4401210
IF(MAXDEP) QPDEPH = QPDEPH*DURAT	S4401220
C CLEAR WORK SPACE.	S4401230
DO 10 I = 1,900	S4401240
10 PLUS(I) = 0.0	S4401250
DO 20 I = 1,4	S4401260
20 QCONV(I) = 1.0	S4401270
C INITIALIZE BOUNDARY LAYERS PARAMETERS.	S4401280
NLK = 1	S4401290
IF(HM(2) .GT. 0.0) NLK = 3	S4401300
KXS = NXS - 1	S4401310
DO 30 I = 1,2	S4401320
ZMET(1,1) = ALT(LAYBOT(I))	S4401330
30 ZMET(1,2) = ALT(LAYTOP(I)+1)	S4401340
ZMET(3,1) = ALT(LAYBOT(1))	S4401350
ZMET(3,2) = ALT(LAYTOP(2)+1)	S4401360
MAXLAB = 1	S4401370
IF(MAXDEP) MAXLAB = 2	S4401380
C	S4401390
C CHECK SEGMENT ENTRY POINT.	S4401400
C	S4401410
IF(NNNTRY .EQ. 10) GOTO 180	S4401420
C	S4401430
C!!!! H.E.C COPY ONLY.	S4401440
IF (BATCH) GO TO 60	S4401450
40 WRITE (ICU,9031) INVNDR,INV,OFF,ULINE,OFF	S4401460
READ (IIU,9032) IFRMT1	S4401470
IF (IFRMT1.EQ.INJ.OR.IFRMT1.EQ.INOJ) GO TO 170	S4401480
IF (IFRMT1.EQ.IBLNK.OR.IFRMT1.EQ.IYSJ.OR.IFRMT1.EQ.IYESJ) GO TO 50	S4401490
WRITE (ICU,9001) INV,OFF,0,0	S4401500
GO TO 40	S4401510
50 WRITE (ICU,9018) CURSUP,CLRLNE	S4401520
60 CONTINUE	S4401530

C!!!!	
C	S4401540
C	S4401550
C	S4401560
C	S4401570
C*** BEGIN LOOP OVER RANGES.	S4401580
C	S4401590
DO 90 IXS = 2,30	S4401600
XT = (IXS-1)*1000.0	S4401610
IF(.NOT.BATCH) WRITE(ICU,9016) CURSUP,MDLNAM,INV,XT,OFF	S4401620
C* CALL SUBROUTINE WHICH COMPUTES WASHOUT DEPOSITION.	S4401630
CALL WASHT(NLK,XT,YT,IXS,WDHOLD,.FALSE.)	S4401640
C* FIND MAXIMUM VALUES AND LOCATIONS OVER ALL RANGES.	S4401650
DO 80 ILK = 1,NLK	S4401660
C PH.	S4401670
IF(CDAMXS(ILK) .GT. VALUES(IXS,ILK)) GOTO 70	S4401680
CDAMXS(ILK) = VALUES(IXS,ILK)	S4401690
PEAKS(1,ILK) = RANGE(IXS,ILK)	S4401700
PEAKS(2,ILK) = BEARNG(IXS,ILK)	S4401710
C AL203.	S4401720
70 I1 = ILK + 3	S4401730
IF(CDAMXS(I1) .GT. VALUES(IXS,I1)) GOTO 80	S4401740
CDAMXS(I1) = VALUES(IXS,I1)	S4401750
PEAKS(1,I1) = RANGE(IXS,I1)	S4401760
PEAKS(2,I1) = BEARNG(IXS,I1)	S4401770
80 CONTINUE	S4401780
90 CONTINUE	S4401790
IF(.NOT.BATCH) WRITE(ICU,9017) CURSUP,CLRDSP,BLNKNG,OFF	S4401800
C	S4401810
C*** LOOP OVER MAJOR BOUNDARIES.	S4401820
C	S4401830
DO 160 ILK = 1,NLK	S4401840
NILK = ILK	S4401850
IF(NLK .GT. 2) NILK = MILK(ILK)	S4401860
JILK = NILK + 3	S4401870
IF(ILK .GT. 2) GOTO 100	S4401880
IBOT = LAYBOT(ILK)	S4401890
ITOP = LAYTOP(ILK)	S4401900
GOTO 110	S4401910
100 IBOT = LAYBOT(1)	S4401920
ITOP = LAYTOP(2)	S4401930
110 CONTINUE	S4401940
C	S4401950
C** LOOP OVER SPECIES.	S4401960
C	S4401970
DO 150 J = 1,4	S4401980
IF(IPLLNT(J) .NE. 1 .AND. IPLLNT(J) .NE. 4) GOTO 150	S4401990
KDX = IPLLNT(J)*3 - 3	S4402000
WRITE(IOU,9002) IVERSN,LOCATN,MDLNAM	S4402010
WRITE(IOU,9003)	S4402020
WRITE(IOU,9005) (IPL(KDX+K),K=1,3),TITLE,ALT(IBOT),ALT(ITOP+1),	S4402030
1 ISTEIN,LSDT,ISDAY,ISMON,ISYEAR,LTIME,LSDT,LDAY,IMON,LYEAR,	S4402040
2 JTIME,LSDT,JDAY,JMON,JYEAR	S4402050

C	PRINT HEADING DEPENDING ON WASHOUT DEPOSITION AND SPECIES OPTION.	S4402060
	WRITE(IOU,9006) (MPTDLB(K,MAXLAB),K=1,4),(MPTDLB(K,MAXLAB),K=4,8)	S4402070
	IF(IPLLNT(J) .EQ. 1) WRITE(IOU,9009)	S4402080
	IF(IPLLNT(J) .EQ. 4) WRITE(IOU,9008)	S4402090
	WRITE(IOU,9007)	S4402100
C		S4402110
C*	BEGIN LOOP OVER RANGES.	S4402120
C		S4402130
	DO 130 IXS = 2,30	S4402140
	IF(IPLLNT(J) .EQ. 1) GOTO 120	S4402150
C	PRINT AL203.	S4402160
	A1 = VALUES(IXS,JILK)	S4402170
	IF (A1 .LE. 0.0) GO TO 130	S4402180
	WRITE(IOU,9010) RANGE(IXS,JILK),BEARNG(IXS,JILK),A1	S4402190
	GOTO 130	S4402200
C	COMPUTE & PRINT PH FOR HCL.	S4402210
120	CONTINUE	S4402220
	A1 = VALUES(IXS,NILK)	S4402230
	IF(A1 .LE. 0.0) GOTO 130	S4402240
	PDEPPH = AMIN1(1.0,AMAX1(A1,1.E-14))	S4402250
	PDEPPH = -ALOGT(PDEPPH)	S4402260
	WRITE(IOU,9010) RANGE(IXS,NILK),BEARNG(IXS,NILK),PDEPPH	S4402270
130	CONTINUE	S4402280
C		S4402290
C**	PRINT MAXIMUM VALUES FOUND OVER ALL RANGES.	S4402300
C		S4402310
	WRITE(IOU,9011)	S4402320
	IF(IPLLNT(J) .NE. 1) GOTO 140	S4402330
C	PH.	S4402340
	CDAMXS(NILK) = AMIN1(1.0,AMAX1(CDAMXS(NILK),1.E-14))	S4402350
	CDAMXS(NILK) = -ALOGT(CDAMXS(NILK))	S4402360
	WRITE(IOU,9012) CDAMXS(NILK),PEAKS(1,NILK),PEAKS(2,NILK)	S4402370
	GOTO 150	S4402380
C	AL203.	S4402390
140	WRITE(IOU,9012) CDAMXS(JILK),PEAKS(1,JILK),PEAKS(2,JILK)	S4402400
150	CONTINUE	S4402410
160	CONTINUE	S4402420
	IF(.NOT.BATCH) WRITE(ICU,9018) CURSUP,CURLFT,CLRDSP	S4402430
C		S4402440
170	CONTINUE	S4402450
C		S4402460
	NNNEST = 3	S4402470
	NNNTRY = 4	S4402480
	CALL REEDM	S4402490
C		S4402500
C		S4402510
180	IER = 0	S4402520
	IF(.NOT.BATCH) GOTO 190	S4402530
	READ(IIU,9013) IDMY	S4402540
	GOTO 200	S4402550
190	WRITE(ICU,9019) INVNDR,INV,OFF,(ULINE,OFF,I=1,2)	S4402560
	CALL IFNBR(IFRMT,12,IER,IIU)	S4402570

IDMY = IFRMT(1)	S4402580
IF(IDMY.EQ.MINUS9) GOTO 620	S4402590
IF(IDMY.NE.MINUS1) GOTO 200	S4402600
JER = JER+1	S4402610
IF (JER .GT. 1) GO TO 610	S4402620
WRITE (ICU,9030)	S4402630
GO TO 190	S4402640
200 JER = 0	S4402650
IF(IDMY .EQ. INJ .OR. IDMY .EQ. INOJ) GOTO 630	S4402660
IF(IDMY.EQ.IBLNK .OR. IDMY.EQ.IYSJ.OR. IDMY.EQ.IYESJ) GOTO 220	S4402670
IF (IER .EQ. 0) GO TO 210	S4402680
WRITE (ICU,9001) INV,OFF,23,0	S4402690
IF (BATCH) GO TO 610	S4402700
GO TO 190	S4402710
210 CONTINUE	S4402720
IBATCH = .TRUE.	S4402730
IIUTMP = IIU	S4402740
CALL CODE(2)	S4402750
READ(IDMY,*) IIU	S4402760
WRITE(ICU,9015) IESCAJ	S4402770
C	S4402780
C*** BEGIN DISCRETE RECEPTOR CALCULATIONS.	S4402790
C	S4402800
220 NXS = 0	S4402810
LINE = 100	S4402820
230 CONTINUE	S4402830
DO 240 I = 1,10	S4402840
240 IFRMT(15+I) = IBLNK	S4402850
IF(.NOT.BATCH .AND. .NOT.IBATCH) GOTO 260	S4402860
IF(NXS .GT. 59) GOTO 460	S4402870
ERR = EXEC(1,IIU,IFRMT,-80)	S4402880
IF(IER(2) .LE. 0) GOTO 460	S4402890
CALL IFNBR(IFRMT,-26,IER,IIU)	S4402900
IF (IER .EQ. 0) GO TO 250	S4402910
WRITE (ICU,9001) INV,OFF,23,1	S4402920
GO TO 230	S4402930
250 CALL CODE(30)	S4402940
READ(IFRMT,*) XT,YT	S4402950
IF(XT .LT. 0.0) GOTO 460	S4402960
GOTO 320	S4402970
260 WRITE(ICU,9020) CURSUP,CLRDSP	S4402980
270 CALL IFNBR(IFRMT,26,IER,IIU)	S4402990
IF (IER .EQ. 0) GO TO 290	S4403000
280 WRITE (ICU,9001) INV,OFF,23,1	S4403010
WRITE (ICU,9020) IBLNK,IBLNK	S4403020
GO TO 270	S4403030
290 CALL CODE(80)	S4403040
READ (IFRMT,*) XT,YT	S4403050
IF (XT .EQ. MINS1) GO TO 300	S4403060
IF (XT .EQ. MINS9) GO TO 620	S4403070
IF (XT .GE. 0.0) GO TO 310	S4403080
GO TO 280	S4403090

300	WRITE(ICU,9015) IESCAJ,IESCAJ	S4403100
	GOTO 180	S4403110
310	WRITE(ICU,9018) (CURSUP,CURLFT,CLRDSP,I=1,2)	S4403120
C		S4403130
C**	MAKE 3 CALCULATIONS PER DISCRETE RECEPTOR.	S4403140
C		S4403150
320	YT1 = YT - 10.0	S4403160
	IF(YT1 .LE. 0.0) YT1 = YT1 + 360.0	S4403170
	NXS = NXS + 1	S4403180
	DISBUF(1,NXS) = XT	S4403190
	DISBUF(2,NXS) = YT1	S4403200
	DO 330 J = 1,10	S4403210
330	IDDISR(J,NXS) = IFRMT(15+J)	S4403220
	DO 340 J = 1,3	S4403230
	CALL WASHT(NLK,XT,YT1,NXS,WDHOLD(1,J),.TRUE.)	S4403240
	YT1 = YT1 + 10.0	S4403250
	IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4403260
340	CONTINUE	S4403270
C		S4403280
C**	SAVE RESULTS IN BUFFER.	S4403290
C		S4403300
	L = 2	S4403310
	DO 360 J = 1,3	S4403320
	DO 350 K = 1,4	S4403330
350	DISBUF(L+K,NXS) = WDHOLD(K,J)	S4403340
360	L = L + 4	S4403350
	IF(BATCH) GOTO 230	S4403360
C		S4403370
C**	DISPLAY DISCRETE RECEPTOR RESULTS.	S4403380
C		S4403390
	IF(LINE .LT. 22) GOTO 370	S4403400
	LINE = 5	S4403410
	WRITE(ICU,9021) (MPTDLB(I,MAXLAB),I=1,8),(ZMET(I,1),ZMET(I,2),	S4403420
	1 I=1,NLK)	S4403430
	WRITE(ICU,9033)	S4403440
370	CONTINUE	S4403450
	LINE = LINE + 3	S4403460
	WRITE(ICU,9022) XT,YT	S4403470
	DO 420 JJ = 1,4	S4403480
	IP = IPLLNT(JJ)	S4403490
	IF(IP .NE. 1 .AND. IP .NE. 4) GOTO 420	S4403500
	KDX = IP*3 - 3	S4403510
	K = 0	S4403520
	IF(IP .EQ. 4) K = 2	S4403530
	L = 0	S4403540
	DO 380 I = 1,2	S4403550
	DO 380 J = 1,3	S4403560
	L = L + 1	S4403570
380	WDOUT(L) = WDHOLD(I+K,J)	S4403580
	DO 390 I = 1,3	S4403590
	L = L + 1	S4403600
390	WDOUT(L) = WDOUT(I) + WDOUT(I+3)	S4403610

IF(IP .NE. 1) GOTO 410	S4403620
DO 400 I = 1,3*NLK	S4403630
AI = AMIN1(1.0,AMAX1(WDOUT(I),1.E-14))	S4403640
400 WDOUT(I) = -ALOGT(AI)	S4403650
410 CONTINUE	S4403660
LINE = LINE + 2	S4403670
WRITE(ICU,9023) INV,(IPL(KDX+J),J=1,3),OFF,(WDOUT(J),J=1,3*NLK)	S4403680
420 CONTINUE	S4403690
IF(NXS .LT. 60) GOTO 430	S4403700
WRITE(ICU,9024)	S4403710
GOTO 460	S4403720
430 IF(IBATCH) GOTO 230	S4403730
WRITE(ICU,9025) INVNDR,INV,OFF,ULINE,OFF	S4403740
IDMY = IBLNK	S4403750
READ(IIU,9013) IDMY	S4403760
IF(IDMY .EQ. MINUS9) GOTO 620	S4403770
IF(IDMY .NE. MINUS1) GOTO 440	S4403780
WRITE(ICU,9015) IESCAJ	S4403790
GOTO 180	S4403800
440 IF(IDMY.EQ.IBLNK.OR.IDMY.EQ.IYSJ.OR.IDMY.EQ.IYESJ) GO TO 230	S4403810
IF (IDMY.EQ.INJ.OR.IDMY.EQ.INOJ) GO TO 450	S4403820
WRITE (ICU,9001) INV,OFF,23,2	S4403830
GO TO 430	S4403840
450 WRITE(ICU,9018) CURSUP,CURLFT,CLRDSP	S4403850
C WRITE BLANK LINE.	S4403860
WRITE(ICU,9013) IBLNK	S4403870
C	S4403880
C** PRINT DISCRETE RECEPTOR RESULT.	S4403890
C	S4403900
460 CONTINUE	S4403910
IF(.NOT.IBATCH) GOTO 470	S4403920
IIU = IIUTMP	S4403930
WRITE(ICU,9013) IBLNK	S4403940
470 DO 600 ILK = 1,NLK	S4403950
DO 590 JJ = 1,4	S4403960
IP = IPLNT(JJ)	S4403970
IF(IP .NE. 1 .AND. IP .NE. 4) GOTO 590	S4403980
KDX = IP*3 - 3	S4403990
WDMAX = 0.0	S4404000
YTMAX = 0.0	S4404010
KKMAX = 1	S4404020
LINE = 100	S4404030
DO 570 KK = 1,NXS	S4404040
IF(LINE .LT. 53) GOTO 500	S4404050
LINE = 15	S4404060
WRITE(IOU,9002) IVERS,LOCATN,MDLNAM	S4404070
WRITE(IOU,9004)	S4404080
WRITE(IOU,9005) (IPL(KDX+J),J=1,3),TITLE,ZMET(ILK,1),ZMET(ILK,2),	S4404090
1 ISTE,LSDT,ISDAY,ISMON,ISYEAR,LTIME,LSDT,LDAY,LMON,LYEAR,	S4404100
2 JTIME,LSDT,JDAY,JMON,JYEAR	S4404110
WRITE(IOU,9026) (MPTDLB(K,MAXLAB),K=1,4),(MPTDLB(K,MAXLAB),K=4,8)	S4404120
IF(IP .NE. 1) GOTO 480	S4404130

WRITE(IOU,9027)	S4404140
K = 0	S4404150
GOTO 490	S4404160
480 WRITE(IOU,9028)	S4404170
K = 2	S4404180
490 WRITE(IOU,9007)	S4404190
500 CONTINUE	S4404200
XT = DISBUF(1, KK)	S4404210
YT1 = DISBUF(2, KK)	S4404220
L = 2	S4404230
DO 560 J = 1, 3	S4404240
IF(ILK .EQ. 3) GOTO 510	S4404250
A1 = DISBUF(L+K+ILK, KK)	S4404260
GOTO 520	S4404270
510 A1 = DISBUF(L+K+1, KK) + DISBUF(L+K+2, KK)	S4404280
520 IF(IP .NE. 1) GOTO 530	S4404290
A1 = AMIN1(1.0, AMAX1(A1, 1.E-14))	S4404300
A1 = -ALOGT(A1)	S4404310
530 IF(A1 .LT. 0.0005) GOTO 550	S4404320
IF(A1 .LT. WDMAX) GOTO 540	S4404330
WDMAX = A1	S4404340
YTMAX = YT1	S4404350
KKMAX = KK	S4404360
540 LINE = LINE + 1	S4404370
IF(J.NE.2) WRITE(IOU,9029) (IBLNK,I=1,10),XT,YT1,A1	S4404380
IF(J.EQ.2) WRITE(IOU,9029) (IDDISR(I, KK), I=1,10),XT,YT1,A1	S4404390
550 YT1 = YT1 + 10.0	S4404400
IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4404410
560 L = L + 4	S4404420
570 CONTINUE	S4404430
IF(IP .NE. 1) GOTO 580	S4404440
WDMAX = AMIN1(1.0, AMAX1(WDMAX, 1.E-14))	S4404450
WDMAX = -ALOGT(WDMAX)	S4404460
580 CONTINUE	S4404470
WRITE(IOU,9011)	S4404480
WRITE(IOU,9012) WDMAX,DISBUF(1, KKMAX),YTMAX	S4404490
590 CONTINUE	S4404500
600 CONTINUE	S4404510
GOTO 630	S4404520
C	S4404530
C*** ERROR EXIT.	S4404540
C	S4404550
610 IERROR(1) = MINS1	S4404560
GOTO 630	S4404570
620 IERROR(1) = 1	S4404580
C	S4404590
630 NNNEST = 1	S4404600
NNNTRY = 3	S4404610
CALL REEDM	S4404620
C	S4404630
CF** FORMAT STATEMENTS.	S4404640
CF.	S4404650

9001 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC. S4404660
 *,I2,1H.,I1/) S4404670
 9002 FORMAT(1H1,38(2H**)/1X,8(2H**),44X,8(2H**)/ S4404680
 1 1X,8(2H**),3X,13HREEDM UPDATE,I5,11H LOCATION ,2A2,8X,8(2H**)/ S4404690
 2 1X,8(2H**),4X,12A2,6H MODEL,10X,8(2H**)/ S4404700
 3 1X,8(2H**),44X,8(2H**)/1X,38(2H**)/) S4404710
 9003 FORMAT(1X,8(2H**),7X,31HMAXIMUM CENTERLINE CALCULATIONS,6X,8(2H**)S4404720
 *) S4404730
 9004 FORMAT(1X,8(2H**),7X,30HDISCRETE RECEPTOR CALCULATIONS,7X,8(2H**))S4404740
 9005 FORMAT(/27X,4HFOR ,3A2,15HAT GROUND-LEVEL/15X,16HDOWNWIND FROM A ,S4404750
 1 14A2,7H LAUNCH/4X,40HCALCULATIONS APPLY TO THE LAYER BETWEEN , S4404760
 2 F6.1,5H AND ,F6.1,7H METERS//9X,31HTHE METEOROLOGICAL DATA IS FROS4404770
 3M,I5,2A2,I4,1X,2A2,I4/19X,16H LAUNCH TIME IS,I10,2A2,I4,1X,2A2,I4S4404780
 4/15X,20HTIME OF EXECUTION IS,I10,2A2,I4,1X,2A2,I4//) S4404790
 9006 FORMAT(46X,3A2,A1/45X,R1,4A2/46X,7HWASHOUT/ S4404800
 1 15X,5HRANGE,9X,7HBEARING,8X,10HDEPOSITION) S4404810
 9007 FORMAT(38(2H--)) S4404820
 9008 FORMAT(13X,8H(METERS),7X,9H(DEGREES),7X,10H(MG./SQ.M)) S4404830
 9009 FORMAT(13X,8H(METERS),7X,9H(DEGREES),10X,4H(PH)) S4404840
 9010 FORMAT(F21.3,F15.3,F17.3) S4404850
 9011 FORMAT(/53X,16HRANGE BEARING/51X,9(2H--)) S4404860
 9012 FORMAT(F15.3,31H IS THE PEAK WASHOUT DEPOSITION,F13.3,F10.3) S4404870
 9013 FORMAT(A2) S4404880
 9014 FORMAT(50H1DIAGNOSTICS FOR WASHOUT DEPOSITION PROGRAM, RPDPM) S4404890
 9015 FORMAT(2A2,A1) S4404900
 9016 FORMAT(A2,12A2,30H MODEL IS PROCESSING RANGE AT ,2A2,F7.1,2A2, S4404910
 17H METERS) S4404920
 9017 FORMAT(2A2,10X,2A2,8HPRINTING,2A2) S4404930
 9018 FORMAT(3A2) S4404940
 9019 FORMAT(46H DO YOU WISH DISCRETE RECEPTOR CALCULATIONS? (,2A2,1HY, S4404950
 1 2A2,2HES,2A2,1H,,2A2,1HN,2A2,2HO,,2A2,3HLU#,2A2,16H OF DATA FILE)S4404960
 2:_) S4404970
 9020 FORMAT(2A2,68H ENTER DISCRETE RECEPTOR LOCATION RELATIVE TO LAUNCHS4404980
 1 PAD. A 20 CHAR./52H COMMENT MAY BE ENTERED STARTING UNDER THE ASTS4404990
 2ERISK.,10X,1H*/33H RANGE(METERS),BEARING(DEGREES):_) S4405000
 9021 FORMAT (1X,37(2H**)/2H *,19X,8A2,19H WASHOUT DEPOSITION,18X,1H*/ S4405010
 *7H LAYERS,F7.1,3H TO,F7.1,2H *,F10.1,3H TO,F8.1,4H *,F10.1,3H TOS4405020
 *,F8.1,3H *) S4405030
 9022 FORMAT(/27H DISCRETE RECEPTOR RANGE =,F8.1,11H, BEARING =,F6.1) S4405040
 9023 FORMAT (32X,3H** ,4A2,A1,2A2,3H **/2H *,2F7.1,F8.1,2(2H *,F8.1,F7.S4405050
 *,F8.1)) S4405060
 9024 FORMAT(63H A MAXIMUM OF 60 DISCRETE RECEPTOR LOCATIONS HAVE BEEN ES4405070
 INTERED./29H THIS SECTION IS TERMINATED._) S4405080
 9025 FORMAT(58H DO YOU WISH TO ENTER ANOTHER DISCRETE RECEPTOR LOCATIONS4405090
 1? (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S4405100
 9026 FORMAT(56X,3A2,A1/55X,R1,4A2/56X,7HWASHOUT/ S4405110
 1 25X,5HRANGE,9X,7HBEARING,8X,10HDEPOSITION) S4405120
 9027 FORMAT(6X,10HIDENTIFIER,7X,8H(METERS),7X,9H(DEGREES),10X,4H(PH)) S4405130
 9028 FORMAT(6X,10HIDENTIFIER,7X,8H(METERS),7X,9H(DEGREES),7X,10H(MG./SQS4405140
 1.M)) S4405150
 9029 FORMAT(1X,10A2,F10.3,F15.3,F17.3) S4405160
 9030 FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS4405170

* IF -1 TYPED AGAIN)	S4405180
C	S4405190
C!!!! H.E.C COPY ONLY.	S4405200
9031 FORMAT (57HDO YOU WISH MAXIMUM CENTERLINE PRECIPITATION DEPOSITIONS	S4405210
*? (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_)	S4405220
9032 FORMAT (A2)	S4405230
C!!!!	S4405240
9033 FORMAT (1X,3(24H*-10 DEG. POINT +10 DEG.),2H */1X,37(2H**))	S4405250
C	S4405260
END	S4405270

REEDM SOURCE MODULE &RPDPN

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FTN4
SUBROUTINE WASHT(NLK,XO,YO,IXS,BUFDIS,DISCRT)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C-----S4500000
C S4500010
C S4500020
C S4500030
C S4500040
C THIS SUBROUTINE CALCULATES THE MAXIMUM PRECIPITATION DEPOSITION S4500050
C FOR A GIVEN RANGE AND MAJOR BOUNDARY. S4500060
C S4500070
C-----S4500080
C S4500090
C S4500100
C**** BEGIN COMMON AREA ****S4500110
C 04/02/82 S4500120
C-----MATH PARAMETERS AND CONSTANTS S4500130
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S4500140
C-----INPUT OPTIONS S4500150
REAL LAMBDA S4500160
INTEGER FILE,GOOD,TITLE S4500170
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S4500180
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S4500190
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S4500200
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S4500210
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S4500220
. ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2) S4500230
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S4500240
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S4500250
. FS(20),MDLNAM(12),DBAR(20) S4500260
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S4500270
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S4500280
. MODEL4,MODEL5,MODEL6 S4500290
INTEGER RUNNUM,RT,CL,CS S4500300
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S4500310
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S4500320
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S4500330
. ,MIXING,MAXDEP,LAYBOT(3) S4500340
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S4500350
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S4500360
. MINUS1,MINUS9,MINUS1,MINUS9, S4500370
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S4500380
. RT(24),TPROPC,IDXRT S4500390
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S4500400
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S4500410
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4500420
. CLRLNE,INSLNE,DELINE S4500430
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S4500440
. INVNDR(2),ULINE(2), S4500450
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4500460
. CLRLNE,INSLNE,DELINE, S4500470
. IESCAJ(3),NULL,IBLNK, S4500480
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S4500490

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C-----VEHICLE PARAMETERS                                S4500500
COMMON /VCLPR/ VPAR(17)                                S4500510
C-----TIME PARAMETERS                                    S4500520
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S4500530
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)            S4500540
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S4500550
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S4500560
RH(30),PTEMP(30),SIGEP(30),SIGAP(30)                  S4500570
C-----LAYER PARAMETERS                                    S4500580
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGX0(29), S4500590
SIGY0(29)                                                S4500600
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)         S4500610
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)              S4500620
C-----CALCULATED NEW LAYER PARAMETERS                   S4500630
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S4500640
SPEEDN(32)                                                S4500650
C-----CONVERSION FACTORS                                 S4500660
COMMON /CNVRT/ QCONV(4),QPDEPH                          S4500670
C                                                         S4500680
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION***** S4500690
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)            S4500700
C-----READ/WRITE BUFFER                                  S4500710
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S4500720
C*****S4500730
C                                                         S4500740
C-----EQUIVALENCE STATEMENTS                             S4500750
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S4500760
,(IPU2,IPAR(4)),(IPU3,IPAR(5))                          S4500770
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)          S4500780
C                                                         S4500790
C****          E N D   O F   C O M M O N   A R E A      ****S4500800
Cq                                                         S4500810
LOGICAL DISCRT                                           S4500820
DIMENSION CI(100),DI(100),YPI(100),SIGYI(100),BUFDIS(1),MILK(3) S4500830
DIMENSION VALUES(30,1),RANGE(30,1),BEARNG(30,1),SIGYBR(30,1) S4500840
DIMENSION INDEX(2)                                       S4500850
EQUIVALENCE (PLUS,RANGE),(PLUS(181),BEARNG),            S4500860
1 (PLUS(361),SIGYBR),(PLUS(547),VALUES)                  S4500870
DATA MILK /2,3,1/                                       S4500880
DATA RAD /.01745329/, RAD1/57.29578/                    S4500890
C                                                         S4500900
C*** INITIALIZE.                                         S4500910
C                                                         S4500920
XOP = XO                                                  S4500930
IF (XOP .EQ. 0.0) XOP = 5.0                              S4500940
ISTART = 1                                                S4500950
SUMSY = 0.0                                               S4500960
INDM = 1                                                  S4500970
DO 10 I = 1,100                                          S4500980
DI(I) = 0.0                                               S4500990
10 CI(I) = 0.0                                           S4501000
C                                                         S4501010

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C***	BEGIN LOOP OVER MAJOR BOUNDARY LAYERS.	S4501020
C		S4501030
	DO 170 ILK = 1,NLK	S4501040
	NILK = ILK	S4501050
	IF(NLK .GT. 1) NILK = MILK(ILK)	S4501060
	IF(ILK .GT. 2) GOTO 20	S4501070
	JF = NLAYS + ILK	S4501080
	IBOT = LAYBOT(ILK)	S4501090
	ITOP = LAYTOP(ILK)	S4501100
	IF(.NOT.DISCRT) YO = DIRN(JF) + 180.0	S4501110
	AVGSY = 0.0	S4501120
	GOTO 30	S4501130
20	CONTINUE	S4501140
C	COMPUTE UPPER LIMITS OF BOUNDARY LAYERS AND DISTANCE ALONG	S4501150
C	ARC FROM CENTERLINES OF BOUNDARY LAYERS AT RANGE XO.	S4501160
	INDEX(1) = ISTART - NSOURC - 1	S4501170
	INDEX(2) = ISTART - 1	S4501180
	DARC = (DIRN(NLAYS+1) - DIRN(NLAYS+2))*RAD*XO	S4501190
	AVGSY = SUMSY/(ISTART+NSOURC-1)	S4501200
	NSOURC = ISTART - 1	S4501210
	ISTART = 1	S4501220
	GOTO 120	S4501230
30	CONTINUE	S4501240
	NSOURC = 0	S4501250
	SPEEDI = 1.0/SPEEDN(JF)	S4501260
	IF(IRUN .EQ. 4) WRITE(10U,9003) ILK,XO,YO	S4501270
C		S4501280
C***	BEGIN LOOP OVER METEOROLOGICAL LAYERS WITHIN MAJOR BOUNDARY.	S4501290
C		S4501300
	DO 110 M = IBOT,ITOP	S4501310
	PDEPMX = 0.0	S4501320
	PDEPPH = 0.0	S4501330
	IF(Q(M) .LE. 0.0) GOTO 100	S4501340
C		S4501350
C**	CALL SUBROUTINE TO COMPUTE DOWNWIND(X) AND CROSSWIND(Y) DISTANCES.	S4501360
C		S4501370
	A1 = DIRN(JF)*RAD	S4501380
	CALL COORD(A1,M,XO,YO,XS,YS,X,Y)	S4501390
C	UPWIND?	S4501400
	IF(IFLG .LT. 0) GOTO 100	S4501410
C		S4501420
C**	CALL SUBROUTINE TO COMPUTE SIGMAS FOR THIS MET LAYER.	S4501430
C		S4501440
	CALL SIGMA(X,M,JF,0,SIGAPN(M),SIGEPN(M),DDIR(M))	S4501450
C	BAD SIGMA Y?	S4501460
	IF(SIGYNK .LE. 0.0) GOTO 100	S4501470
C		S4501480
C**	COMPUTE PRIMARY TERMS.	S4501490
C		S4501500
	A1 = (X - 2.15*SIGXNK)*SPEEDI	S4501510
	IF(TIM1 .LT. A1) GOTO 40	S4501520
	IF(IRUN .NE. 4) GOTO 40	S4501530

	WRITE(10U,9001) XO,YO,M	S4501540
40	CONTINUE	S4501550
C	2.506628 = SQRT(2*PI)	S4501560
	A2 = LAMBDA*Q(M)/(2.506628*SPEEDN(JF)*SIGYNK)	S4501570
	IF(.NOT.DISCRT) GOTO 50	S4501580
C		S4501590
C**	ALAT IS LATERAL TERM FOR NON-CENTERLINE CALCULATIONS.	S4501600
C		S4501610
	ALAT = Y/SIGYNK	S4501620
	ALAT = -.5*ALAT*ALAT	S4501630
	IF(ALAT .LT. -60.0) GOTO 100	S4501640
	ALAT = EXP(ALAT)	S4501650
50	IF(SIGXNK .LE. 0.0) GOTO 100	S4501660
C		S4501670
C**	COMPUTE CENTERLINE PREC. DEPOSITION (PDEPMX) AND ACID (PDEPPH).	S4501680
C		S4501690
	IF(MAXDEP) GOTO 60	S4501700
C	TIME-DEPENDENT.	S4501710
	PDEPMX = -LAMBDA*(X*SPEEDI-TIM1)	S4501720
	IF(PDEPMX .LT. -60.0) GOTO 100	S4501730
	PDEPMX = EXP(PDEPMX)*A2	S4501740
	PDEPPH = PDEPMX	S4501750
	GOTO 70	S4501760
60	CONTINUE	S4501770
C	MAXIMUM POSSIBLE.	S4501780
	PDEPMX = -LAMBDA*2.15*SIGXNK*SPEEDI	S4501790
	IF(PDEPMX .LT. -60.0) GOTO 100	S4501800
	PDEPMX = EXP(PDEPMX)*A2	S4501810
C	837.2093 = 3600/4.3 = HOURS TO SECONDS/STANDARD DEV.	S4501820
	PDEPPH = PDEPMX*837.2093*SPEEDN(JF)/SIGXNK	S4501830
70	CONTINUE	S4501840
	IF(.NOT.DISCRT) GOTO 80	S4501850
	PDEPPH = PDEPPH*ALAT	S4501860
	PDEPMX = PDEPMX*ALAT	S4501870
C		S4501880
C***	SAVE NON-ZERO RESULTS.	S4501890
C		S4501900
80	IF(PDEPMX) 100,100,90	S4501910
90	CI(INDM) = PDEPMX	S4501920
	DI(INDM) = PDEPPH	S4501930
	SIGYI(INDM) = SIGYNK	S4501940
	AVGSY = AVGSY + SIGYNK	S4501950
	YPI(INDM) = Y	S4501960
	NSOURC = NSOURC + 1	S4501970
	INDM = INDM + 1	S4501980
100	CONTINUE	S4501990
	IF(IRUN .NE. 4) GOTO 110	S4502000
	WRITE(10U,9002) ILK,M,IBOT,ITOP,JF,XO,YO,XS,YS,X,Y,SIGXNK,SIGYNK,	S4502010
1	A1,A2,PDEP,LAMBDA,SPEEDN(JF),TIM1,Q(M),PDEPMX,PDEPPH.	S4502020
110	CONTINUE	S4502030
	SUMSY = SUMSY + AVGSY	S4502040
	AVGSY = AVGSY/NSOURC	S4502050

120	IF(NSOURC .EQ. 0) GOTO 170	S4502060
	I = ISTART + NSOURC - 1	S4502070
	IF(.NOT.DISCRT) GOTO 140	S4502080
	IF(ILK .EQ. 3) GOTO 170	S4502090
C		S4502100
C***	SUM DEPOSITION OVER MET LAYERS FOR DISCRETE RECEPTOR.	S4502110
C		S4502120
	PDEPPH = 0.0	S4502130
	PDEPMX = 0.0	S4502140
	DO 130 J = ISTART,I	S4502150
	PDEPPH = DI(J) + PDEPPH	S4502160
130	PDEPMX = CI(J) + PDEPMX	S4502170
	ISTART = ISTART + NSOURC	S4502180
C		S4502190
C***	SAVE RESULTS IN COMMON BLOCK EXTRA FOR DISCRETE RECEPTOR.	S4502200
C		S4502210
C	LOCATION 1 & 2 = PH WASHOUT DEPOSITION,	S4502220
C	3 & 4 = AL2O3 WASHOUT DEPOSITION.	S4502230
	BUFDIS(ILK) = PDEPPH*QPDEPH*VPAR(13)	S4502240
	BUFDIS(ILK+2) = PDEPMX*1000.0*VPAR(16)	S4502250
	GOTO 170	S4502260
140	CONTINUE	S4502270
C		S4502280
C***	COMPUTE MAXIMUM DEPOSITION ON GROUND. CALL SUBROUTINE PDEPR.	S4502290
C		S4502300
	IF(ILK .GT. 2) GOTO 150	S4502310
	CALL PDEPR(CI,DI,YPI,SIGYI,ISTART,I,PDEPMX,PDEPPH,YMX,YMPH)	S4502320
	ILKMX = ILK	S4502330
	ILKPH = ILK	S4502340
	ISTART = ISTART + NSOURC	S4502350
	GOTO 160	S4502360
150	CALL MAX2L(CI,DI,YPI,SIGYI,DARC,INDEX,PDEPMX,PDEPPH,	S4502370
	1 YMX,YMPH,ILKMX,ILKPH)	S4502380
160	CONTINUE	S4502390
C		S4502400
C***	SAVE RESULTS IN COMMON BLOCK EXTRA FOR MAXIMUM CENTERLINE	S4502410
C***	CALCULATIONS.	S4502420
C		S4502430
	I1 = NILK + 3	S4502440
	RANGE(IXS,NILK) = SQRT(XO*XO+YMPH*YMPH)	S4502450
	RANGE(IXS,I1) = SQRT(XO*XO+YMX*YMX)	S4502460
C	RADI CONVERTS RADIAN TO DEGREES.	S4502470
	A1 = ATAN2(YMPH,XOP)*RADI	S4502480
	A2 = A1 + DIRN(NLAYS+ILKPH) + 180.0	S4502490
	IF(A2 .GT. 360.0) A2 = A2 - 360.0	S4502500
	IF(A2 .LE. 0.0) A2 = A2 + 360.0	S4502510
	BEARNG(IXS,NILK) = A2	S4502520
	IF(YMPH .NE. YMX) A1 = ATAN2(YMX,XOP)*RADI	S4502530
	A2 = A1 + DIRN(NLAYS+ILKMX) + 180.0	S4502540
	BEARNG(IXS,I1) = AMOD(A2,360.0)	S4502550
	SIGYBR(IXS,NILK) = AVGSY	S4502560
	SIGYBR(IXS,I1) = AVGSY	S4502570

VALUES(IXS,NILK) = PDEPPH*QPDEPH*VPAR(13)	S4502580
VALUES(IXS,I1) = PDEPMX*1000.0*VPAR(16)	S4502590
170 IF(IRUN .EQ. 4) WRITE(10U,9004) ILK,ILKMX,ILKPH,ISTART,NSOURC,	S4502600
1 PDEPMX,PDEPPH,YMMX,YMPH,AVGSY	S4502610
C	S4502620
C***	S4502630
C	S4502640
RETURN	S4502650
C	S4502660
CF** FORMAT STATEMENTS.	S4502670
CF	S4502680
9001 FORMAT(62H0*** REEDM WARNING 023, PRECIPITATION DEPOSITION CALCULS	S4502690
1TED AT/8H RANGE =,F10.3,11H, AZIMUTH =,F10.3,12H, MET. LAYER,I3/	S4502700
222H MAY BE OVER ESTIMATED)	S4502710
9002 FORMAT(20H ILK,M,IBOT,ITOP,JF=,5I6/17H XO,YO,XS,YS,X,Y=,6E12.6/	S4502720
1 33H SIGXNK,SIGYNK,A1,A2,PDEP,LAMBDA=,6E12.6/	S4502730
2 29H SPEEDN,TIM1,Q,PDEPMX,PDEPPH=,5E12.6)	S4502740
9003 FORMAT(/34H DIAGNOSTICS FOR DOWNWIND LOCATION,I6,2F10.2)	S4502750
9004 FORMAT(31H ILK,ILKMX,ILKPH,ISTART,NSOURC=,5I6/	S4502760
1 31H PDEPMX,PDEPPH,YMMX,YMPH,AVGSY=,5E13.6)	S4502770
END	S4502780

SUBROUTINE PDEPR(CI,DI,YPI,SIGYI,ISTART,NSOURC,RCHI,RDHI,	S4600000
1 RYC,RYD)	S4600010
. , UPDATE: 8213 SOURCE: 03 SEP 81 LOCATION: KSC	S4600020
C-----	S4600030
C	S4600040
C THIS SUBROUTINE CALCULATES THE MAXIMUM CENTER LINE	S4600050
C WASHOUT DEPOSITION.	S4600060
C	S4600070
C-----	S4600080
DIMENSION CI(1),DI(1),SIGYI(1),YPI(1)	S4600090
IF(NSOURC.EQ.1) GO TO 20	S4600100
DO 10 I = ISTART,NSOURC-1	S4600110
DO 10 J=I+1,NSOURC	S4600120
IF(YPI(I).GT.YPI(J)) GO TO 10	S4600130
TMP1=YPI(I)	S4600140
YPI(I)=YPI(J)	S4600150
YPI(J)=TMP1	S4600160
TMP1=SIGYI(I)	S4600170
SIGYI(I)=SIGYI(J)	S4600180
SIGYI(J)=TMP1	S4600190
TMP1=CI(I)	S4600200
CI(I)=CI(J)	S4600210
CI(J)=TMP1	S4600220
TMP1=DI(I)	S4600230
DI(I)=DI(J)	S4600240
DI(J)=TMP1	S4600250
10 CONTINUE	S4600260
20 CONTINUE	S4600270
ISTR= ISTART	S4600280
RCHI=0.0	S4600290
RDHI=0.0	S4600300
RY=0.0	S4600310
C-----CALCULATE THE NUMBER OF SOURCES IN A GROUP	S4600320
30 SMIN=SIGYI(ISTR)	S4600330
I=ISTR	S4600340
40 IF(I.GT.NSOURC) GO TO 150	S4600350
IF(I.EQ.NSOURC) GO TO 50	S4600360
J=I+1	S4600370
TMP1=YPI(I)-YPI(J)	S4600380
TMP2=1.18*(SIGYI(I)+SIGYI(J))	S4600390
IF(TMP1.GT.TMP2) GO TO 50	S4600400
I=I+1	S4600410
GO TO 40	S4600420
50 CONTINUE	S4600430
SMIN=SIGYI(ISTR)	S4600440
IF(ISTR.EQ.NSOURC) GO TO 70	S4600450
IF(ISTR.EQ.I) GO TO 70	S4600460
DO 60 M=ISTR+1,I	S4600470
60 SMIN=AMIN1(SMIN,SIGYI(M))	S4600480
70 YINC=.08*SMIN	S4600490
YY=YPI(ISTR)	S4600500

80 YCHI=0.0	S4600510
YDHI=0.0	S4600520
IF(YY.LT.YPI(I)) GO TO 130	S4600530
DO 90 M=ISTART,NSOURC	S4600540
EX=(YY-YPI(M))/SIGYI(M)	S4600550
EX = TEXP(EX)	S4600560
YDHI=YDHI+DI(M)*EX	S4600570
YCHI=YCHI+CI(M)*EX	S4600580
90 CONTINUE	S4600590
100 IF(YCHI.LT.RCHI) GO TO 110	S4600600
RCHI=YCHI	S4600610
RYC = YY	S4600620
110 IF(YDHI .LT. RDHI) GOTO 120	S4600630
RDHI = YDHI	S4600640
RYD = YY	S4600650
120 YY=YY-YINC	S4600660
GO TO 80	S4600670
130 CONTINUE	S4600680
140 ISTR=I+1	S4600690
GO TO 30	S4600700
150 IF(RCHI.LE.0.0) RYC = 0.0	S4600710
IF(RDHI .LE. 0.0) RYD = 0.0	S4600720
RETURN	S4600730
END	S4600740

SUBROUTINE MAX2L(CI,DI,YPI,SIGYI,DARC,INDEX,RCHI,RDHI,	S4700000
1 YMCL,YMDL,ILKC,ILKD)	S4700010
. , UPDATE: 8213 SOURCE: 03 SEP 81 LOCATION: KSC	S4700020
C-----	S4700030
C	S4700040
C THIS SUBROUTINE FINDS THE MAXIMUM DEPOSITION VALUE THAT OCCURS	S4700050
C OVER TWO MAJOR BOUNDARY LAYERS. FOR A GIVEN DOWNWIND DISTANCE,	S4700060
C THIS ROUTINE INCREMENTS ALONG THE YBAR AXES OF BOTH BOUNDARY	S4700070
C CENTERLINES AND SAVES THE MAXIMUM VALUES FOUND. THIS SUBROUTINE	S4700080
C ASSUMES THAT ALL YBAR VALUES HAVE BEEN ORDERED IN DESCENDING	S4700090
C ORDER WITH RESPECT TO EACH BOUNDARY LAYER CENTERLINE. AT EACH	S4700100
C INCREMENTAL POINT ON THE YBAR AXES, YBAR VALUES ARE CALCULATED	S4700110
C FROM EACH SOURCE CLOUD ON THE YBAR AXES TO THE POINT.	S4700120
C-----	S4700130
C	S4700140
C DIMENSION CI(1),DI(1),SIGYI(1),YPI(1),INDEX(1)	S4700150
C	S4700160
C DATA RAD/.01745329/	S4700170
C*** INITIALIZE.	S4700180
C	S4700190
C DARC = DARC	S4700200
C RCHI = 0.0	S4700210
C RDHI = 0.0	S4700220
C RAD CONVERTS FROM DEGREES TO RADIANS.	S4700230
C DTHETR = DTHET*RAD	S4700240
C	S4700250
C*** BEGIN LOOP OVER MAJOR BOUNDARY LAYERS.	S4700260
C	S4700270
C DO 140 ILK = 1,2	S4700280
C GET BOUNDARY INDICES.	S4700290
C IF(ILK .EQ. 2) GOTO 10	S4700300
C ISTILK = 1	S4700310
C IENILK = INDEX(1)	S4700320
C ISTOLK = IENILK + 1	S4700330
C IENOLK = INDEX(2)	S4700340
C GOTO 20	S4700350
10 ISTOLK = ISTILK	S4700360
C IENOLK = IENILK	S4700370
C ISTILK = INDEX(1) + 1	S4700380
C IENILK = INDEX(2)	S4700390
C DARC = -DARC	S4700400
C	S4700410
C** BEGIN LOOP OVER INTERVAL WITHIN WHICH TO INCREMENT.	S4700420
C	S4700430
C 20 ISTR = ISTILK	S4700440
C 30 IF(ISTR .GT. IENILK) GOTO 140	S4700450
C	S4700460
C* COMPUTE NUMBER OF SOURCES IN THIS INTERVAL.	S4700470
C	S4700480
C I = ISTR	S4700490
	S4700500

40 IF(I .EQ. IENILK) GOTO 50	S4700510
I1 = I + 1	S4700520
A1 = YPI(I) - YPI(I1)	S4700530
A2 = (SIGYI(I) + SIGYI(I1))*1.18	S4700540
IF(A1 .GT. A2) GOTO 50	S4700550
I = I + 1	S4700560
GOTO 40	S4700570
50 IEND = I	S4700580
C	S4700590
C* COMPUTE INCREMENTAL DISTANCE(DYILK) & INITIALIZE STARTING	S4700600
C* POINT(YILK).	S4700610
C	S4700620
SMIN = 1.E30	S4700630
DO 60 I = 1, IEND	S4700640
SMIN = AMIN1(SMIN, SIGYI(I))	S4700650
60 CONTINUE	S4700660
DYILK = .08*SMIN	S4700670
YILK = YPI(ISTR)	S4700680
C	S4700690
C* COMPUTE VALUES FOR THIS INCREMENTAL POINT & SAVE MAXIMUMS.	S4700700
C	S4700710
70 YCHI = 0.0	S4700720
YDHI = 0.0	S4700730
IF(ISTILK .GT. IENILK) GOTO 90	S4700740
C SUM ALONG YBAR AXIS OF ILK CENTERLINE.	S4700750
DO 80 M = ISTILK, IENILK	S4700760
A1 = (YILK - YPI(M))/SIGYI(M)	S4700770
A1 = TEXP(A1)	S4700780
YCHI = YCHI + CI(M)*A1	S4700790
YDHI = YDHI + DI(M)*A1	S4700800
80 CONTINUE	S4700810
90 IF(ISTOLK .GT. IENOLK) GOTO 110	S4700820
C SUM ALONG YBAR AXIS OF OTHER(OLK) CENTERLINE.	S4700830
DO 100 M = ISTOLK, IENOLK	S4700840
A1 = (YILK + DARCY - YPI(M))/SIGYI(M)	S4700850
A1 = TEXP(A1)	S4700860
YCHI = YCHI + CI(M)*A1	S4700870
YDHI = YDHI + DI(M)*A1	S4700880
100 CONTINUE	S4700890
C SAVE MAXIMUMS.	S4700900
110 IF(YCHI .LT. RCHI) GOTO 120	S4700910
RCHI = YCHI	S4700920
YMCL = YILK	S4700930
ILKC = ILK	S4700940
120 IF(YDHI .LT. RDHI) GOTO 130	S4700950
RDHI = YDHI	S4700960
YMDL = YILK	S4700970
ILKD = ILK	S4700980
130 CONTINUE	S4700990
C	S4701000
C* DECREMENT TO NEXT POINT.	S4701010
C	S4701020

	YILK = YILK - DYILK	S4701030
	IF(YILK .GT. YPI(IEND)) GOTO 70	S4701040
C		S4701050
C*	GO GET NEXT INTERVAL.	S4701060
	ISTR = IEND + 1	S4701070
	GOTO 30	S4701080
C		S4701090
C**	END OF MAJOR BOUNDARY LOOP. EITHER GET OTHER CENTERLINE OR DONE.	S4701100
C		S4701110
	140 CONTINUE	S4701120
	IF(RCHI .LE. 0.0) YMCL = 0.0	S4701130
	IF(RDHI .LE. 0.0) YMDL = 0.0	S4701140
C		S4701150
C		S4701160
C		S4701170
	RETURN	S4701180
	END	S4701190

REEDM SOURCE MODULE &RGDPM

FTN4	S4800000
PROGRAM RGDPM(5)	S4800010
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S4800020
C:::	S4800030
C:::	S4800040
C:::	S4800050
C:::	S4800060
C:::	S4800070
C::: ORGANIZATION: H. E. CRAMER CO., INC.	S4800080
C:::	S4800090
C::: WORK FOR: DR. J. B. STEPHENS (ES84)	S4800100
C:::	S4800110
C::: PROGRAM CODE: RGDPM	S4800120
C:::	S4800130
C::: PROGRAM DESCRIPTION:	S4800140
C::: THIS PROGRAM CALCULATES GROUND-LEVEL DEPOSITION DUE TO GRAVITA-	S4800150
C::: TIONAL SETTLING FOR A SOURCE THAT EXTENDS VERTICALLY THROUGH AN	S4800160
C::: ENTIRE BOUNDARY LAYER. THE AL2O3 SPECIES IS THE ONLY ONE TO	S4800170
C::: HAVE GRAVITATIONAL DEPOSITION. CALCULATIONS ARE MADE EVERY	S4800180
C::: KILOMETER DOWNWIND FROM THE LAUNCH SITE AND, UPON REQUEST,	S4800190
C::: CALCULATIONS MAY ALSO BE MADE AT USER-DEFINED DISCRETE	S4800200
C::: LOCATIONS. THIS PROGRAM CONTROLS THE PRINT OUTPUT AND PLOT	S4800210
C::: OPTIONS.	S4800220
C:::	S4800230
C:::	S4800240
C:::	S4800250
C	S4800260
Cc	S4800270
C**** BEGIN COMMON AREA	S4800280
C 04/02/82	S4800290
C-----MATH PARAMETERS AND CONSTANTS	S4800300
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S4800310
C-----INPUT OPTIONS	S4800320
REAL LAMBDA	S4800330
INTEGER FILE,GOOD,TITLE	S4800340
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S4800350
ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S4800360
XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S4800370
IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S4800380
ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S4800390
,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S4800400
,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S4800410
TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S4800420
FS(20),MDLNAM(12),DBAR(20)	S4800430
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S4800440
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S4800450
MODEL4,MODEL5,MODEL6	S4800460
INTEGER RUNNUM,RT,CL,CS	S4800470
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S4800480
DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S4800490
SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	

.	,MIXING,MAXDEP,LAYBOT(3)	S4800500
.	,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S4800510
.	ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S4800520
.	MINUS1,MINUS9,MINS1,MINS9,	S4800530
.	MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S4800540
.	RT(24),TPROPC,IDXRT	S4800550
C-----	TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S4800560
	INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S4800570
.	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S4800580
.	CLRLNE,INSLNE,DELIN	S4800590
	COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S4800600
.	INVNDR(2),ULINE(2),	S4800610
.	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S4800620
.	CLRLNE,INSLNE,DELIN,	S4800630
.	IESCAJ(3),NULL,IBLNK,	S4800640
.	IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S4800650
C-----	VEHICLE PARAMETERS	S4800660
	COMMON /VCLPR/ VPAR(17)	S4800670
C-----	TIME PARAMETERS	S4800680
	COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	S4800690
.	LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	S4800700
C-----	SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)	S4800710
	COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),	S4800720
.	RH(30),PTMP(30),SIGEP(30),SIGAP(30)	S4800730
C-----	LAYER PARAMETERS	S4800740
	COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGX0(29),	S4800750
.	SIGY0(29)	S4800760
C-----	CALCULATED BOUNDRY DATA (FOR NEW LAYERS)	S4800770
	COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)	S4800780
C-----	CALCULATED NEW LAYER PARAMETERS	S4800790
	COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),	S4800800
.	SPEEDN(32)	S4800810
C-----	CONVERSION FACTORS	S4800820
	COMMON /CNVRT/ QCONV(4),QPDEPH	S4800830
C		S4800840
C*****	COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****	S4800850
	COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)	S4800860
C-----	READ/WRITE BUFFER	S4800870
C-----	A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879	S4800880
C*****		S4800890
C		S4800900
C-----	EQUIVALENCE STATEMENTS	S4800910
	EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))	S4800920
.	,(IPU2,IPAR(4)),(IPU3,IPAR(5))	S4800930
	EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)	S4800940
C		S4800950
C****	END OF COMMON AREA	S4800960
Cc		S4800970
	INTEGER UNITS(3,2)	S4800980
C		S4800990
	DIMENSION ZTOP(2),MILK(2),GDHOLD(4,3),CDAMXS(1)	S4801000
	DIMENSION RANGE(30,1),BEARNG(30,1),SIGYBR(30,1),VALUES(30,1),	S4801010

	1 PEAKS(2,1),PHIS(50),UBARNK(50),SIGAPK(50),SIGEPK(50),IER(2)	S4801020
C	NOTE: THESE DIMENSIONS (10) LIMIT THE MAXIMUM NUMBER OF	S4801030
C	SETTLING CATS TO 10 (SEE MAXNVS IN READM). OTHERWISE,	S4801040
C	THE MAXIMUM COULD BE 20 IF MACHINE SPACE ALLOWED.	S4801050
	DIMENSION GDEPNM(10,50),GDEPP1(10),GDEPP2(10,30),DBARI3(10)	S4801060
	1 ,GDPP22(10,3,60)	S4801070
C		S4801080
	EQUIVALENCE (PLUS,RANGE),(PLUS(181),BEARNG),	S4801090
	1 (PLUS(361),SIGYBR),(PLUS(541),CDAMXS),(PLUS(547),VALUES),	S4801100
	2 (PLUS(727),PEAKS), (ERR,IER), (GDEPP2,GDPP22)	S4801110
C		S4801120
	DATA MILK /5,4/	S4801130
	DATA UNITS /2HMG,2HRA,2HM.,2H P,2HAR,2HT./	S4801140
	DATA ISXS,NXS,INCXS /2,30,1/	S4801150
	DATA JVERSN/8213/	S4801160
C		S4801170
C	IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S4801180
C***	INITIALIZE.	S4801190
C		S4801200
C		S4801210
C		S4801220
C!!!!	H.E.C COPY ONLY.	S4801230
	IF (BATCH) GO TO 30	S4801240
10	WRITE (ICU,9017) INVNDR,INV,OFF,ULINE,OFF	S4801250
	READ (IIU,9018) IFRMT1	S4801260
	IF (IFRMT1.EQ.INJ.OR.IFRMT1.EQ.INOJ) GO TO 220	S4801270
	IF (IFRMT1.EQ.IBLNK.OR.IFRMT1.EQ.IYSJ.OR.IFRMT1.EQ.IYESJ) GO TO 20	S4801280
	WRITE (ICU,9001) INV,OFF,0,0	S4801290
	GO TO 10	S4801300
20	WRITE (ICU,9014) CURSUP,CLRLNE	S4801310
30	CONTINUE	S4801320
C!!!!		S4801330
C		S4801340
	JER = 0	S4801350
	DO 40 I = 1,900	S4801360
40	PLUS(I) = 0.0	S4801370
	DO 50 I = 1,4	S4801380
50	QCONV(I) = 1.0	S4801390
	IF(LAYTOP(2) .EQ. 0) GOTO 60	S4801400
	NLK = 2	S4801410
	GOTO 70	S4801420
60	NLK = 1	S4801430
70	CONTINUE	S4801440
	IBOT = LAYBOT(1)	S4801450
	ITOP = LAYTOP(1)	S4801460
	ZTOP(1) = ALT(ITOP+1)	S4801470
	NILK = 6 - NLK	S4801480
	ITOP = LAYTOP(2)	S4801490
	ZTOP(2) = ALT(ITOP+1)	S4801500
C*	PARTICLES CONVERSION. DENSITY OF AL2O3 PARTICLE USED HERE = 1E6	S4801510
C*	G/M**3 (ACTUAL DENSITY = 3.42E6 G/M**3)	S4801520
C	1.9098593E-6 = 6/(PI*1.00E6)	S4801530

DO 80 I = 1,NVS	S4801540
80 DBARI3(I) = 1.9098593E-6/(1.0E-6*DBAR(I))*3	S4801550
C IF(IRUN .EQ. 4) WRITE(IOU,9007)	S4801560
CALL SHEAR(UBARNK,PHIS,SIGAPK,SIGEPK,0)	S4801570
C CHECK SEGMENT ENTRY POINT.	S4801580
C	S4801590
C	S4801600
C	S4801610
C	S4801620
C	S4801630
C	S4801640
IF(IRUN .NE. 4) GOTO 140	S4801650
90 WRITE(ICU,9015)	S4801660
CALL IFNBR(IFRMT,20,IER,IIU)	S4801670
IF (IER .EQ. 0) GO TO 110	S4801680
100 WRITE (ICU,9001) INV,OFF,0,0	S4801690
IF (BATCH) GO TO 230	S4801700
GO TO 90	S4801710
110 CALL CODE(80)	S4801720
READ (IFRMT,*) ISXS,NXS,INCXS	S4801730
IF (ISXS .NE. MINS1) GO TO 120	S4801740
JER = JER+1	S4801750
IF (JER .GT. 1) GO TO 230	S4801760
WRITE (ICU,9016)	S4801770
GO TO 90	S4801780
120 JER = 0	S4801790
IF (ISXS .EQ. MINS9) GO TO 240	S4801800
IF (ISXS .LE. NX.S.AND.INCXS .LE. NX.S) GO TO 130	S4801810
GO TO 100	S4801820
130 WRITE(ICU,9008) IESCAJ	S4801830
140 CONTINUE	S4801840
LINE = 100	S4801850
C	S4801860
C*** BEGIN LOOP OVER RANGES.	S4801870
C	S4801880
DO 170 IXS = ISXS,NXS,INCXS	S4801890
XO = (IXS-1)*1000.0	S4801900
YO = DIRN(NLAYS+NLK)+180.0	S4801910
IF (YO .GT. 360.0) YO = YO-360.0	S4801920
IF(.NOT.BATCH) WRITE(ICU,9012) CURSUP,MDLNAM,INV,XO,OFF	S4801930
C	S4801940
C** CALL GRDEP TO COMPUTE GRAVITATIONAL DEPOSITION.	S4801950
C	S4801960
CALL GRDEP(XO,YO,IXS,.FALSE.,NLK,GDHDOLD,PHIS,UBARNK,	S4801970
1 GDEPNM,GDEPP1,GDEPP2(1,IXS),DBARI3,SIGAPK,SIGEPK)	S4801980
C	S4801990
C** FIND MAXIMUM VALUES OVER ALL MAJOR BOUNDARY LAYERS.	S4802000
C	S4802010
DO 150 ILK = 1,5	S4802020
IF(CDAMXS(ILK) .GT. VALUES(IXS,ILK)) GOTO 150	S4802030
CDAMXS(ILK) = VALUES(IXS,ILK)	S4802040
PEAKS(1,ILK) = RANGE(IXS,ILK)	S4802050

PEAKS(2,ILK) = BEARNG(IXS,ILK)	S4802060
150 CONTINUE	S4802070
C	S4802080
C** FOR RESEARCH MODE, PRINT PARTICLE VALUES FOR ALL	S4802090
C** SETTLING CATEGORIES OF THE FIRST BOUNDARY LAYER.	S4802100
C	S4802110
IF(IRUN .LT. 3) GOTO 170	S4802120
IF(LINE .LT. 57) GOTO 160	S4802130
LINE = 24	S4802140
WRITE(IOU,9002) IVERSN,LOCATN,MDLNAM	S4802150
WRITE(IOU,9003)	S4802160
WRITE(IOU,9004) TITLE,ZTOP(1),ISTIME,LSDT,ISDAY,ISMON,ISYEAR,	S4802170
1 LTIME,LSDT,LDAY,LMON,LYEAR,JTIME,LSDT,JDAY,JMON,JYEAR	S4802180
WRITE(IOU,9009)	S4802190
160 A1 = VALUES(IXS,NLK+3)	S4802200
A2 = VALUES(IXS,NLK)	S4802210
IF(A1 .LT. 0.0005 .AND. A2 .LT. 0.05) GOTO 170	S4802220
WRITE(IOU,9010) RANGE(IXS,NLK),BEARNG(IXS,NLK),A1,A2,	S4802230
1 (N,GDEPP1(N),N=1,NVS)	S4802240
LINE = LINE + NVS/4 + 1	S4802250
170 CONTINUE	S4802260
IF(.NOT.BATCH) WRITE(ICU,9013) CURSUP,CLRDSP,BLNKNG,OFF	S4802270
C	S4802280
C*** BEGIN OUTPUT -- LOOP OVER MAJOR BOUNDARY LAYERS.	S4802290
C	S4802300
DO 210 ILK = 1,NLK	S4802310
I1 = ILK + 3	S4802320
IF(NLK .EQ. 2) I1 = MILK(ILK)	S4802330
IF(IRUN .GT. 2 .AND. ILK .EQ. 1) GOTO 210	S4802340
C	S4802350
C** BEGIN LOOP OVER RANGES.	S4802360
C	S4802370
LINE = 100	S4802380
DO 200 IXS = ISXS,NXS,INCXS	S4802390
IF(LINE .LT. 57) GOTO 180	S4802400
C* PRINT HEADING.	S4802410
LINE = 24	S4802420
WRITE(IOU,9002) IVERSN,LOCATN,MDLNAM	S4802430
WRITE(IOU,9003)	S4802440
WRITE(IOU,9004) TITLE,ZTOP(ILK),ISTIME,LSDT,ISDAY,ISMON,ISYEAR,	S4802450
1 LTIME,LSDT,LDAY,LMON,LYEAR,JTIME,LSDT,JDAY,JMON,JYEAR	S4802460
IF(IRUN .GT. 2) WRITE(IOU,9009)	S4802470
IF(IRUN .LT. 3) WRITE(IOU,9011)	S4802480
C* PRINT RESULTS.	S4802490
180 A1 = VALUES(IXS,I1)	S4802500
A2 = VALUES(IXS,I1-3)	S4802510
IF (IRUN .LT. 3.AND.A1 .LT. .0005) GO TO 200	S4802520
IF(A1 .LT. 0.0005 .AND. A2 .LT. 0.05) GOTO 200	S4802530
IF(IRUN .GT. 2) GOTO 190	S4802540
WRITE(IOU,9005) RANGE(IXS,I1),BEARNG(IXS,I1),A1,A2	S4802550
GOTO 200	S4802560
190 WRITE(IOU,9010) RANGE(IXS,I1),BEARNG(IXS,I1),A1,A2,	S4802570

1	(N,GDEPP2(N,IXS),N=1,NVS)	S4802580
	LINE = LINE + NVS/5 + 1	S4802590
200	CONTINUE	S4802600
C		S4802610
C**	PRINT MAXIMUM VALUE FOUND OVER ALL RANGES.	S4802620
C		S4802630
210	WRITE(10U,9006) CDAMXS(11),PEAKS(1,11),PEAKS(2,11)	S4802640
	IF(.NOT.BATCH) WRITE(10U,9014) CURSUP,CURLFT,CLRDSP	S4802650
C	UNLOCK PRINTER.	S4802660
220	CONTINUE	S4802670
C		S4802680
C		S4802690
C		S4802700
	NNNEST = 3	S4802710
	NNNTRY = 4	S4802720
	GO TO 260	S4802730
C		S4802740
C***	ERROR EXIT.	S4802750
C		S4802760
230	IERROR(1) = MINS1	S4802770
	GO TO 250	S4802780
240	IERROR(1) = 1	S4802790
250	NNNEST = 1	S4802800
	NNNTRY = 3	S4802810
260	CONTINUE	S4802820
	CALL REEDM	S4802830
C		S4802840
C		S4802850
C		S4802860
CF**	FORMAT STATEMENTS.	S4802870
CF		S4802880
9001	FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S4802890
	*,12,1H.,11/)	S4802900
9002	FORMAT(1H1,38(2H**)/1X,8(2H**),44X,8(2H**)/	S4802910
	1 1X,8(2H**),3X,13HREEDM UPDATE,15,11H LOCATION ,2A2,8X,8(2H**)/	S4802920
	2 1X,8(2H**),7X,12A2,6H MODEL,7X,8(2H**)/	S4802930
	3 1X,8(2H**),44X,8(2H**)/1X,38(2H**)/)	S4802940
9003	FORMAT(1X,8(2H**),7X,31HMAXIMUM CENTERLINE CALCULATIONS,6X,8(2H**)	S4802950
	*)	S4802960
9004	FORMAT(/27X,25HFOR AL203 AT GROUND-LEVEL/15X,16HDOWNWIND FROM A ,	S4802970
	1 14A2,7H LAUNCH/4X,56HCALCULATIONS APPLY TO THE LAYER BETWEEN THE	S4802980
	2SURFACE AND ,F7.2,7H METERS//9X,31HTHE METEOROLOGICAL DATA IS FROMS	S4802990
	3 ,15,2A2,14,1X,2A2,14/19X,16H LAUNCH TIME IS,110,2A2,14,1X,2A2,14S	S4803000
	4/15X,20HTIME OF EXECUTION IS,110,2A2,14,1X,2A2,14//)	S4803010
9005	FORMAT(11X,2F12.3,F14.3,1PE18.5)	S4803020
9006	FORMAT(/56X,16H RANGE BEARING/53X,10(2H--)/F15.3,	S4803030
	1 37H IS THE PEAK GRAVITATIONAL DEPOSITION,2F10.3)	S4803040
9007	FORMAT(47H1DIAGNOSTICS FOR GRAVITATIONAL DEPOSITION MODEL/)	S4803050
9008	FORMAT(2A2,A1)	S4803060
9009	FORMAT(30X,28H- GRAVITATIONAL DEPOSITION -/	S4803070
	1 7X,50H RANGE BEARING (MILLIGRAMS/ (PARTICLES/,16X,	S4803080
	2 34H- PARTICLES BY SETTLING CATEGORY -/	S4803090

3 5X,25H(METERS)	(DEGREES)	,2(11H(SQ. METER),5X),	S4803100
4 3(12H CAT.	DEP.,7X)/5X,57(2H--))		S4803110
9010	FORMAT(1X,2F12.3,F14.3,1PE18.5,2X,3(I6,E13.5)/(59X,3(I6,E13.5)))		S4803120
9011	FORMAT(40X,28H- GRAVITATIONAL DEPOSITION -/		S4803130
1 17X,50HRANGE	BEARING (MILLIGRAMS/	(PARTICLES//	S4803140
2 15X,25H(METERS)	(DEGREES)	,2(11H(SQ. METER),5X)/15X,27(2H--	S4803150
	3))		S4803160
9012	FORMAT(A2,1X,12A2,30H MODEL IS PROCESSING RANGE AT ,2A2,F7.1,2A2,		S4803170
1 7H METERS)			S4803180
9013	FORMAT(2A2,10X,2A2,8HPRINTING,2A2)		S4803190
9014	FORMAT(3A2)		S4803200
9015	FORMAT(41H DIAGNOSTIC RUN. ENTER ISXS,NXS,INCXS:_)		S4803210
9016	FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS		S4803220
	* IF -1 TYPED AGAIN)		S4803230
C			S4803240
C!!!!	H.E.C COPY ONLY.		S4803250
9017	FORMAT (57HDO YOU WISH MAXIMUM CENTERLINE GRAVITATIONAL DEPOSITIONS		S4803260
	*?(,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_)		S4803270
9018	FORMAT (A2)		S4803280
C!!!!			S4803290
C			S4803300
			S4803310
	END		

REEDM SOURCE MODULE &RGPDm

FTN4		S4900000
PROGRAM RGPDM(5)		S4900010
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC		S4900020
C:::.....		S4900030
C:::.....		S4900040
C:::		:::S4900050
C:::		:::S4900060
C::: ORGANIZATION: H. E. CRAMER CO., INC.		:::S4900070
C:::		:::S4900080
C::: WORK FOR: DR. J. B. STEPHENS (ES84)		:::S4900090
C:::		:::S4900100
C::: PROGRAM CODE: RGPDM		:::S4900110
C:::		:::S4900120
C::: PROGRAM DESCRIPTION:		:::S4900130
C::: THIS PROGRAM CALCULATES GROUND-LEVEL DEPOSITION DUE TO GRAVITA-		:::S4900140
C::: TIONAL SETTLING FOR A SOURCE THAT EXTENDS VERTICALLY THROUGH AN		:::S4900150
C::: ENTIRE BOUNDARY LAYER. THE AL2O3 SPECIES IS THE ONLY ONE TO		:::S4900160
C::: HAVE GRAVITATIONAL DEPOSITION. CALCULATIONS ARE MADE EVERY		:::S4900170
C::: KILOMETER DOWNWIND FROM THE LAUNCH SITE AND, UPON REQUEST,		:::S4900180
C::: CALCULATIONS MAY ALSO BE MADE AT USER-DEFINED DISCRETE		:::S4900190
C::: LOCATIONS. THIS PROGRAM CONTROLS THE PRINT OUTPUT AND PLOT		:::S4900200
C::: OPTIONS.		:::S4900210
C:::		:::S4900220
C:::.....		S4900230
C:::.....		S4900240
C		S4900250
Cc		S4900260
C****	BEGIN COMMON AREA	****S4900270
C 04/02/82		S4900280
C-----MATH PARAMETERS AND CONSTANTS		S4900290
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC		S4900300
C-----INPUT OPTIONS		S4900310
REAL LAMBDA		S4900320
INTEGER FILE,GOOD,TITLE		S4900330
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,		S4900340
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,		S4900350
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,		S4900360
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,		S4900370
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)		S4900380
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)		S4900390
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),		S4900400
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),		S4900410
. FS(20),MDLNAM(12),DBAR(20)		S4900420
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES		S4900430
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,		S4900440
. MODEL4,MODEL5,MODEL6		S4900450
INTEGER RUNNUM,RT,CL,CS		S4900460
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,		S4900470
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,		S4900480
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP		S4900490

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.           ,MIXING,MAXDEP,LAYBOT(3)                      S4900500
.           ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,      S4900510
.           ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),      S4900520
.           MINUS1,MINUS9,MINS1,MINS9,                      S4900530
.           MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S4900540
.           RT(24),TPROPC,IDXRT                              S4900550
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S4900560
      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,           S4900570
.           TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4900580
.           CLRLNE,INSLNE,DELNE                             S4900590
      COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S4900600
.           INVNDR(2),ULINE(2),                             S4900610
.           TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4900620
.           CLRLNE,INSLNE,DELNE,                             S4900630
.           IESCAJ(3),NULL,IBLNK,                           S4900640
.           IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)        S4900650
C-----VEHICLE PARAMETERS                                     S4900660
      COMMON /VCLPR/ VPAR(17)                               S4900670
C-----TIME PARAMETERS                                       S4900680
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S4900690
.           LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)      S4900700
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S4900710
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S4900720
.           RH(30),PTEMP(30),SIGEP(30),SIGAP(30)              S4900730
C-----LAYER PARAMETERS                                       S4900740
      COMMON /LAYER/ DX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S4900750
.           SIGYO(29)                                          S4900760
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)            S4900770
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)              S4900780
C-----CALCULATED NEW LAYER PARAMETERS                       S4900790
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S4900800
.           SPEEDN(32)                                         S4900810
C-----CONVERSION FACTORS                                     S4900820
      COMMON /CNVRT/ QCONV(4),QPDEPH                          S4900830
C                                                                S4900840
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S4900850
      COMMON /EXTRA/      NCOM(1),      NTOTAL(1),      PLUS(900) S4900860
C-----READ/WRITE BUFFER                                     S4900870
C-----A R R A Y      = 2077 + 1      + 1      + 2 * 900      = 3879S4900880
C*****S4900890
C                                                                S4900900
C-----EQUIVALENCE STATEMENTS                                S4900910
      EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S4900920
.           ,(IPU2,IPAR(4)),(IPU3,IPAR(5))                  S4900930
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)        S4900940
C                                                                S4900950
C****          E N D   O F   C O M M O N   A R E A          ****S4900960
C¢                                                                S4900970
      INTEGER UNITS(3,2)                                       S4900980
      LOGICAL IBATCH                                           S4900990
C                                                                S4901000
      DIMENSION DISBUF(14,1),ZTOP(2),GDHOLD(4,3),            S4901010

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1	PHIS(50),UBARNK(50),SIGAPK(50),SIGEPK(50),IER(2)	S4901020
C	NOTE: THESE DIMENSIONS (10) LIMIT THE MAXIMUM NUMBER OF	S4901030
C	SETTLING CATS TO 10 (SEE MAXNVS IN READM). OTHERWISE,	S4901040
C	THE MAXIMUM COULD BE 20 IF MACHINE SPACE ALLOWED.	S4901050
	DIMENSION GDEPNM(10,50),GDEPP1(10),GDEPP2(10,30),DBARI3(10)	S4901060
	1 ,GDPP22(10,3,60),IDDISR(10,60)	S4901070
C		S4901080
	EQUIVALENCE (PLUS,DISBUF),	S4901090
	2 (ERR,IER), (GDEPP2,GDPP22)	S4901100
C		S4901110
	DATA UNITS /2HMG,2HRA,2HM.,2H P,2HAR,2HT./	S4901120
	DATA NXS /30/	S4901130
	DATA IBATCH /.FALSE./	S4901140
	DATA JVERSN/8213/	S4901150
C		S4901160
C		S4901170
	IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S4901180
C***	INITIALIZE.	S4901190
C		S4901200
	JER = 0	S4901210
	DO 10 I=1,900	S4901220
10	PLUS(I) = 0.0	S4901230
	DO 20 I=1,4	S4901240
20	QCONV(I) = 1.0	S4901250
	IF(LAYTOP(2) .EQ. 0) GOTO 30	S4901260
	NLK = 2	S4901270
	GOTO 40	S4901280
30	NLK = 1	S4901290
40	CONTINUE	S4901300
	IBOT = LAYBOT(1)	S4901310
	ITOP = LAYTOP(1)	S4901320
	ZTOP(1) = ALT(ITOP+1)	S4901330
	NILK = 6 - NLK	S4901340
	ITOP = LAYTOP(2)	S4901350
	ZTOP(2) = ALT(ITOP+1)	S4901360
C*	PARTICLES CONVERSION. DENSITY OF AL2O3 PARTICLE USED HERE = 1E6	S4901370
C*	G/M**3 (ACTUAL DENSITY = 3.42E6 G/M**3)	S4901380
C	1.9098593E-6 = 6/(PI*1.00E6)	S4901390
	DO 50 I = 1,NVS	S4901400
50	DBARI3(I) = 1.9098593E-6/(1.0E-6*DBAR(I))**3	S4901410
C		S4901420
	IF(IRUN .EQ. 4) WRITE(IOU,9007)	S4901430
	CALL SHEAR(UBARNK,PHIS,SIGAPK,SIGEPK,0)	S4901440
C		S4901450
C***	CHECK FOR DISCRETE RECEPTOR CALCULATIONS.	S4901460
C		S4901470
60	IER = 0	S4901480
	IF(.NOT.BATCH) GOTO 70	S4901490
	READ(IIU,9005) IDMY	S4901500
	GOTO 80	S4901510
70	WRITE(ICU,9015) INVNDR,INV,OFF,(ULINE,OFF,I=1,2)	S4901520
	CALL IFNBR(IFRMT,14,IER,IIU)	S4901530

IDMY = IFRMT(1)	S4901540
IF(IDMY.EQ.MINUS9) GOTO 420	S4901550
IF(IDMY.NE.MINUS1) GO TO 80	S4901560
JER = JER+1	S4901570
IF (JER .GT. 1) GO TO 410	S4901580
WRITE (ICU,9022)	S4901590
GO TO 70	S4901600
80 JER = 0	S4901610
IF(IDMY .EQ. INJ .OR. IDMY .EQ. INOJ) GOTO 430	S4901620
IF(IDMY.EQ.IBLNK.OR.IDMY.EQ.IYSJ.OR.IDMY.EQ.IYESJ) GOTO 100	S4901630
IF (IER .EQ. 0) GO TO 90	S4901640
WRITE (ICU,9001) INV,OFF,23,0	S4901650
IF (BATCH) GO TO 410	S4901660
GO TO 70	S4901670
90 IBATCH = .TRUE.	S4901680
IIUTMP = IIU	S4901690
CALL CODE(2)	S4901700
READ(IDMY,*) IIU	S4901710
WRITE(ICU,9008) IESCAJ	S4901720
C	S4901730
C*** BEGIN DISCRETE RECEPTOR CALCULATIONS.	S4901740
C	S4901750
100 GDMAX = 0.0	S4901760
YTMAX = 0.0	S4901770
MIXS = 1	S4901780
NXS = 0	S4901790
LINED = 100	S4901800
LINEP = 100	S4901810
C QUERY RECEPTOR LOCATION.	S4901820
110 CONTINUE	S4901830
DO 120 J = 1,10	S4901840
120 IFRMT(15+J) = IBLNK	S4901850
IF(.NOT.BATCH .AND. .NOT.IBATCH) GOTO 140	S4901860
IF(NXS .GT. 59) GOTO 320	S4901870
ERR = EXEC(1,IIU,IFRMT,-80)	S4901880
IF(IER(2) .LE. 0) GOTO 320	S4901890
CALL IFNBR(IFRMT,-26,IER,IIU)	S4901900
IF (IER .EQ. 0) GO TO 130	S4901910
WRITE (ICU,9001) INV,OFF,23,1	S4901920
GO TO 110	S4901930
130 CALL CODE(30)	S4901940
READ(IFRMT,*) XT,YT	S4901950
IF(XT .LT. 0.0) GOTO 320	S4901960
GOTO 200	S4901970
140 WRITE(ICU,9009) CURSUP,CLRDSP	S4901980
150 CALL IFNBR(IFRMT,26,IER,IIU)	S4901990
IF (IER .EQ. 0) GO TO 170	S4902000
160 WRITE (ICU,9001) INV,OFF,23,1	S4902010
WRITE (ICU,9009) IBLNK,IBLNK	S4902020
GO TO 150	S4902030
170 CALL CODE(80)	S4902040
READ (IFRMT,*) XT,YT	S4902050

IF (XT .EQ. MINS1) GO TO 180	S4902060
IF (XT .EQ. MINS9) GO TO 420	S4902070
IF (XT .GE. 0.0) GO TO 190	S4902080
GO TO 160	S4902090
180 WRITE(ICU,9008) IESCAJ	S4902100
GOTO 60	S4902110
190 WRITE(ICU,9010) (CURSUP,CURLFT,CLRDSP,I=1,2)	S4902120
C	S4902130
C** MAKE 3 CALCULATIONS PER DISCRETE RECEPTOR ENTERED.	S4902140
C	S4902150
200 YT1 = YT - 10.0	S4902160
IF(YT1 .LE. 0.0) YT1 = YT1 + 360.0	S4902170
NXS = NXs + 1	S4902180
DISBUF(1,NXS) = XT	S4902190
DISBUF(2,NXS) = YT1	S4902200
DO 210 J = 1,10	S4902210
210 IDDISR(J,NXS) = IFRMT(15+J)	S4902220
DO 250 J = 1,3	S4902230
DO 220 I=1,4	S4902240
220 GDHOLD(I,J) = 0.0	S4902250
C* CALL GRDEP TO COMPUTE GRAVITATIONAL DEPOSITION.	S4902260
CALL GRDEP(XT,YT1,NXS,TRUE.,NLK,GDHOLD(1,J),PHIS,UBARNK,	S4902270
1 GDEPNM,GDEPPI,GDPP22(1,J,NXS),DBARI3,SIGAPK,SIGEPK)	S4902280
C	S4902290
C* FOR RESEARCH MODE, PRINT PARTICLE VALUES FOR ALL SETTLING	S4902300
C* CATEGORIES OF THE FIRST BOUNDARY LAYER.	S4902310
C	S4902320
IF(IRUN .LT. 3) GOTO 240	S4902330
IF(LINEP .LT. 53) GOTO 230	S4902340
LINEP = 23	S4902350
WRITE(IOU,9002) IVERSNI,LOCATN,MDLNAM	S4902360
WRITE(IOU,9006)	S4902370
WRITE(IOU,9003) TITLE,ZTOP(1),ISTIME,LSDT,ISDAY,ISMON,ISYEAR,	S4902380
1 LTIME,LSDT,LDAY,LMON,LYEAR,JTIME,LSDT,JDAY,JMON,JYEAR	S4902390
WRITE(IOU,9019)	S4902400
230 A1 = GDHOLD(1,J)	S4902410
A2 = GDHOLD(3,J)	S4902420
IF(A1 .LT. 0.0005 .AND. A2 .LT. 0.05) GOTO 240	S4902430
IF(J.NE.2) WRITE(IOU,9020) XT,YT1,A1,A2,(N,GDEPPI(N),N=1,NVS)	S4902440
IF(J.EQ.2) WRITE(IOU,9016) (IDDISR(N,NXS),N=1,10),XT,YT1,A1,A2,	S4902450
1 (N,GDEPPI(N),N=1,NVS)	S4902460
LINEP = LINEP + NVS/4 + 1	S4902470
IF(GDMAX .GT. A1) GOTO 240	S4902480
GDMAX = A1	S4902490
YTMAX = YT1	S4902500
MIXS = NXs	S4902510
240 YT1 = YT1 + 10.0	S4902520
IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4902530
250 CONTINUE	S4902540
C	S4902550
C** SAVE RESULTS IN BUFFER.	S4902560
C	S4902570

L = 2	S4902580
DO 270 J = 1,3	S4902590
DO 260 K = 1,4	S4902600
260 DISBUF(L+K,NXS) = GDHOLD(K,J)	S4902610
270 L = L + 4	S4902620
IF(BATCH) GOTO 110	S4902630
C	S4902640
C** DISPLAY DISCRETE RECEPTOR RESULTS.	S4902650
C	S4902660
C DISPLAY HEADING.	S4902670
IF(LINED .LT. 22) GOTO 280	S4902680
LINED = 5	S4902690
WRITE(ICU,9011) (ZTOP(I),I=1,NLK)	S4902700
WRITE(ICU,9023)	S4902710
280 CONTINUE	S4902720
LINED = LINED + 5	S4902730
C DISPLAY LOCATION AND RESULTS.	S4902740
WRITE(ICU,9012) XT,YT,((UNITS(I,K),I=1,3),((GDHOLD(J+K-1,I),	S4902750
1 I=1,3),J=K,K+1),K=1,2)	S4902760
IF(NXS .LT. 60) GOTO 290	S4902770
C MAX. NO. OF RECEPTORS HAVE BEEN ENTERED.	S4902780
WRITE(ICU,9013)	S4902790
GOTO 320	S4902800
C QUERY ANOTHER RECEPTOR.	S4902810
290 IF(IBATCH) GOTO 110	S4902820
WRITE(ICU,9014) INVNDR,INV,OFF,ULINE,OFF	S4902830
IDMY = IBLNK	S4902840
READ(IIU,9005) IDMY	S4902850
IF(IDMY .EQ. MINUS9) GOTO 420	S4902860
IF(IDMY .NE. MINUS1) GOTO 300	S4902870
WRITE(ICU,9008) IESCAJ	S4902880
GOTO 60	S4902890
300 IF(IDMY.EQ.IBLNK.OR.IDMY.EQ.IYSJ.OR.IDMY.EQ.IYESJ) GO TO 110	S4902900
IF (IDMY .EQ. INJ.OR.IDMY .EQ.INOJ) GO TO 310	S4902910
WRITE (ICU,9001) INV,OFF,23,2	S4902920
GO TO 290	S4902930
C CURSOR UP AND WRITE BLANK LINE.	S4902940
310 WRITE(ICU,9010) CURSUP,CURLFT,CLRDSP	S4902950
WRITE(ICU,9005)	S4902960
C** PRINT MAXIMUM FOR LAYER ONE, RESEARCH MODE.	S4902970
IF(IRUN .GT. 2) WRITE(IOU,9004) GDMAX,DISBUF(1,MIXS),YTMAX	S4902980
C	S4902990
C** PRINT DISCRETE RECEPTOR RESULTS.	S4903000
C	S4903010
320 CONTINUE	S4903020
IF(.NOT.IBATCH) GOTO 330	S4903030
IIU = IIUTMP	S4903040
WRITE(ICU,9005) IBLNK	S4903050
C* BEGIN LOOP OVER MAJOR BOUNDARY LAYERS.	S4903060
330 DO 400 ILK = 1,NLK	S4903070
IF(IRUN .GT. 2 .AND. ILK .EQ. 1) GOTO 400	S4903080
GDMAX = 0.0	S4903090

YTMAX = 0.0	S4903100
MIXS = 1	S4903110
LINEP = 100	S4903120
C* BEGIN LOOP OVER NUMBER OF DISCRETE RECEPTORS.	S4903130
DO 390 IXS = 1,NXS	S4903140
IF(LINEP .LT. 53) GOTO 340	S4903150
LINEP = 23	S4903160
C PRINT HEADING.	S4903170
WRITE(IOU,9002) IVERSN,LOCATN,MDLNAM	S4903180
WRITE(IOU,9006)	S4903190
WRITE(IOU,9003) TITLE,ZTOP(ILK),ISTIME,LSDT,ISDAY,ISMON,ISYEAR,	S4903200
1 LTIME,LSDT,LDAY,LMON,LYEAR,JTIME,LSDT,JDAY,JMON,JYEAR	S4903210
IF(IRUN .GT. 2) WRITE(IOU,9019)	S4903220
IF(IRUN .LT. 3) WRITE(IOU,9021)	S4903230
340 XT = DISBUF(1,IXS)	S4903240
YT1 = DISBUF(2,IXS)	S4903250
L = 2	S4903260
DO 380 J = 1,3	S4903270
C PRINT RESULTS.	S4903280
A1 = DISBUF(L+ILK,IXS)	S4903290
A2 = DISBUF(L+ILK+2,IXS)	S4903300
IF(A1 .LT. 0.0005 .AND. A2 .LT. 0.05) GOTO 370	S4903310
IF(A1 .LT. GDMAX) GOTO 350	S4903320
GDMAX = A1	S4903330
YTMAX = YT1	S4903340
MIXS = IXS	S4903350
350 IF(IRUN .GT. 2) GOTO 360	S4903360
LINEP = LINEP + 1	S4903370
IF(J.NE.2) WRITE(IOU,9018) XT,YT1,A1,A2	S4903380
IF(J.EQ.2) WRITE(IOU,9017) (IDDISR(N,IXS),N=1,10),XT,YT1,A1,A2	S4903390
GOTO 370	S4903400
360 IF(J.NE.2) WRITE(IOU,9020) XT,YT1,A1,A2,(N,GDPP22(N,J,IXS),	S4903410
1 N=1,NVS)	S4903420
IF(J.EQ.2) WRITE(IOU,9016) (IDDISR(N,IXS),N=1,10),XT,YT1,A1,A2,	S4903430
1 (N,GDPP22(N,J,IXS),N=1,NVS)	S4903440
LINEP = LINEP + NVS/4 + 1	S4903450
370 YT1 = YT1 + 10.0	S4903460
IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4903470
380 L = L + 4	S4903480
390 CONTINUE	S4903490
C* PRINT MAXIMUM RESULT FOUND OVER DISCRETE RECEPTORS.	S4903500
WRITE(IOU,9004) GDMAX,DISBUF(1,MIXS),YTMAX	S4903510
400 CONTINUE	S4903520
GOTO 430	S4903530
C	S4903540
C*** ERROR EXIT.	S4903550
C	S4903560
410 IERROR(1) = MINS1	S4903570
GOTO 430	S4903580
420 IERROR(1) = 1	S4903590
C	S4903600
C*** RETURN TO MAIN PROGRAM.	S4903610

C		S4903620
430	CONTINUE	S4903630
	NNNEST = 1	S4903640
	NNNTRY = 3	S4903650
	CALL REEDM	S4903660
C		S4903670
CF**	FORMAT STATEMENTS.	S4903680
CF		S4903690
9001	FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S4903700
	*,I2,1H.,I1/)	S4903710
9002	FORMAT(1H1,38(2H**)/1X,8(2H**),44X,8(2H**)/	S4903720
	1 1X,8(2H**),3X,13HREEDM UPDATE,I5,11H LOCATION ,2A2,8X,8(2H**)/	S4903730
	2 1X,8(2H**),7X,12A2,6H MODEL,7X,8(2H**)/	S4903740
	3 1X,8(2H**),44X,8(2H**)/1X,38(2H**)/)	S4903750
9003	FORMAT(/27X,25HFOR AL203 AT GROUND-LEVEL/15X,16HDOWNWIND FROM A ,	S4903760
	1 14A2,7H LAUNCH/4X,56HCALCULATIONS APPLY TO THE LAYER BETWEEN THE	S4903770
	2SURFACE AND ,F7.2,6H METERS//9X,31HTHE METEOROLOGICAL DATA IS FROMS	S4903780
	3 ,I5,2A2,I4,1X,2A2,I4/19X,16H LAUNCH TIME IS,I10,2A2,I4,1X,2A2,I4S	S4903790
	4/15X,20HTIME OF EXECUTION IS,I10,2A2,I4,1X,2A2,I4//)	S4903800
9004	FORMAT(/56X,16HRRANGE BEARING/53X,10(2H--)/F15.3,	S4903810
	1 37H IS THE PEAK GRAVITATIONAL DEPOSITION,2F10.3)	S4903820
9005	FORMAT(A2)	S4903830
9006	FORMAT(1X,8(2H**),7X,30HDISCRETE RECEPTOR CALCULATIONS,7X,	S4903840
	1 8(2H**))	S4903850
9007	FORMAT(47HIDIAGNOSTICS FOR GRAVITATIONAL DEPOSITION MODEL/)	S4903860
9008	FORMAT(2A2,A1)	S4903870
9009	FORMAT(2A2,68H ENTER DISCRETE RECEPTOR LOCATION RELATIVE TO LAUNCHS	S4903880
	1 PAD. A 20 CHAR./52H COMMENT MAY BE ENTERED STARTING UNDER THE ASTS	S4903890
	2ERISK.,10X,1H*/33H RANGE(METERS),BEARING(DEGREES):_)	S4903900
9010	FORMAT(3A2)	S4903910
9011	FORMAT(1X,37(2H**)/23X,34HGRAVITATIONAL DEPOSITION FOR A1203/	S4903920
	1 10H LAYERS = ,2(1H*,7X,11HSURFACE TO ,F7.2,7X))	S4903930
9012	FORMAT(/11X,26HDISCRETE RECEPTOR RANGE = ,F7.1,11H, BEARING = ,F6.1S	S4903940
	1/1X,3A2,1X,2(3H *,3(1X,F9.3))/1X,3A2,1X,2(3H *,1P3E10.3))	S4903950
9013	FORMAT(63H A MAXIMUM OF 60 DISCRETE RECEPTOR LOCATIONS HAVE BEEN ES	S4903960
	INTERED./29H THIS SECTION IS TERMINATED._)	S4903970
9014	FORMAT(58H DO YOU WISH TO ENTER ANOTHER DISCRETE RECEPTOR LOCATIONS	S4903980
	1?(,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_)	S4903990
9015	FORMAT(46H DO YOU WISH DISCRETE RECEPTOR CALCULATIONS? (,2A2,1HY,	S4904000
	1 2A2,2HES,2A2,1H,,2A2,1HN,2A2,2HO,,2A2,3HLU#,2A2,16H OF DATA FILE)	S4904010
	2:_)	S4904020
9016	FORMAT(1X,10A2,1X,2F11.3,F13.3,1PE18.5,2X,3(I5,E13.5)/	S4904030
	1 (73X,3(I5,E13.5)))	S4904040
9017	FORMAT(1X,10A2,2F12.3,F14.3,1PE18.5)	S4904050
9018	FORMAT(21X,2F12.3,F14.3,1PE18.5)	S4904060
9019	FORMAT(49X,28H- GRAVITATIONAL DEPOSITION -/	S4904070
	1 28X,48HRRANGE BEARING (MILLIGRAMS/ (PARTICLES/,14X,	S4904080
	2 34H- PARTICLES BY SETTLING CATEGORY -/6X,10HIDENTIFIER,10X,	S4904090
	3 34H(METERS) (DEGREES) (SQ. METER),5X,11H(SQ. METER),4X,	S4904100
	4 3(12HCAT. DEP.,6X)/1X,65(2H--))	S4904110
9020	FORMAT(22X,2F11.3,F13.3,1PE18.5,2X,3(I5,E13.5)/(73X,3(I5,E13.5)))	S4904120
9021	FORMAT(50X,28H- GRAVITATIONAL DEPOSITION -/	S4904130

1	27X,50HRANGE	BEARING	(MILLIGRAMS/	(PARTICLES//6X,	S4904140
2	10HIDENTIFIER,9X,25H(METERS)	(DEGREES)	,2(11H(SQ. METER),5XS	S4904150	
	3)/1X,38(2H--))			S4904160	
9022	FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS				S4904170
	* IF -1 TYPED AGAIN)				S4904180
9023	FORMAT(8X,2(33H	* -10 DEG.	POINT	+10 DEG.)/1X,37(2H**))	S4904190
	END				S4904200

REEDM SOURCE MODULE &RGDPN

FTN4		S5000000
SUBROUTINE GRDEP(XO,YO,IXS,DISCRT,NLK,BUFDIS,PHIS,UBARNK,		S5000010
1 GDEPNM,GDEPP1,GDEPP2,DBARI3,SIGAPK,SIGEPK)		S5000020
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC		S5000030
C-----		S5000040
C		S5000050
C THIS SUBROUTINE COMPUTES GRAVITATIONAL DEPOSITION FOR A GIVEN		S5000060
C RANGE AND BEARING (XO,YO) OVER ALL BOUNDARY LAYERS.		S5000070
C		S5000080
C-----		S5000090
Cc		S5000100
C**** BEGIN COMMON AREA ****		S5000110
C 04/02/82		S5000120
C-----MATH PARAMETERS AND CONSTANTS		S5000130
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMA C		S5000140
C-----INPUT OPTIONS		S5000150
REAL LAMBDA		S5000160
INTEGER FILE,GOOD,TITLE		S5000170
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,		S5000180
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,		S5000190
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,		S5000200
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,		S5000210
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)		S5000220
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)		S5000230
. ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),		S5000240
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),		S5000250
. FS(20),MDLNAM(12),DBAR(20)		S5000260
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES		S5000270
LOGICAL ISNDF0,CRT,MAXDEP,BATCH,GASSET,GRVSET,		S5000280
. MODEL4,MODEL5,MODEL6		S5000290
INTEGER RUNNUM,RT,CL,CS		S5000300
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,		S5000310
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,		S5000320
. SIGZ,ISNDF0,CRT,LAYTOP(3),ITDU,KEEP		S5000330
. ,MIXING,MAXDEP,LAYBOT(3)		S5000340
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,		S5000350
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),		S5000360
. MINUS1,MINUS9,MINS1,MINS9,		S5000370
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,		S5000380
. RT(24),TPROPC,IDXRT		S5000390
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.		S5000400
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,		S5000410
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,		S5000420
. CLRLNE,INSLNE,DELNE		S5000430
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),		S5000440
. INVNDR(2),ULINE(2),		S5000450
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,		S5000460
. CLRLNE,INSLNE,DELNE,		S5000470
. IESCAJ(3),NULL,IBLNK,		S5000480
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)		S5000490

C-----VEHICLE PARAMETERS	S5000500
COMMON /VCLPR/ VPAR(17)	S5000510
C-----TIME PARAMETERS	S5000520
COMMON /TIME/ JTIME, JDAY, JYEAR, ISTIME, ISDAY, ISYEAR, LTIME,	S5000530
LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2)	S5000540
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)	S5000550
COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30),	S5000560
RH(30), PTEMP(30), SIGEP(30), SIGAP(30)	S5000570
C-----LAYER PARAMETERS	S5000580
COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29),	S5000590
SIGYO(29)	S5000600
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)	S5000610
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6)	S5000620
C-----CALCULATED NEW LAYER PARAMETERS	S5000630
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32),	S5000640
SPEEDN(32)	S5000650
C-----CONVERSION FACTORS	S5000660
COMMON /CNVRT/ QCONV(4), QPDEPH	S5000670
C	S5000680
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****	S5000690
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)	S5000700
C-----READ/WRITE BUFFER	S5000710
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879	S5000720
C*****	S5000730
C	S5000740
C-----EQUIVALENCE STATEMENTS	S5000750
EQUIVALENCE (IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3))	S5000760
, (IPU2, IPAR(4)), (IPU3, IPAR(5))	S5000770
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1)	S5000780
C	S5000790
C****	****S5000800
END OF COMMON AREA	
C	S5000810
LOGICAL DISCRT, FIRST	S5000820
DIMENSION CI(50), YPI(50), SIGYI(50), ALATM(50), YMCL(2), AVGSY(2)	S5000830
DIMENSION RANGE(30,1), BEARNG(30,1), SIGYBR(30,1), VALUES(30,1),	S5000840
1 PHIS(1), UBARNK(1), SIGAPK(1), SIGEPK(1), MILK(2), BUFDIS(1)	S5000850
DIMENSION GDEPRT(20), GDEPNM(10,1), GDEPP1(1), GDEPP2(1), DBARI3(1)	S5000860
C	S5000870
C VPAR(16) = % OF AL2O3 IN VEHICLE.	S5000880
EQUIVALENCE (VPAR(16), AL2O3)	S5000890
EQUIVALENCE (PLUS, RANGE), (PLUS(181), BEARNG),	S5000900
1 (PLUS(361), SIGYBR), (PLUS(547), VALUES)	S5000910
C	S5000920
DATA MILK /5.4/, SQR2PI /0.3989423/	S5000930
DATA RAD /.01745329/, RAD1/57.29578/, TWOPI/6.283185/	S5000940
C	S5000950
C*** INITIALIZE.	S5000960
C	S5000970
XOP = XO	S5000980
IF (XOP .EQ. 0.0) XOP = 5.0	S5000990
LOOP = 0	S5001000
10 CONTINUE	S5001010

DO 20 I = 1,50	S5001020
CI(I) = 0.0	S5001030
DO 20 J=1,NVS	S5001040
20 GDEPNM(J,I) = 0.0	S5001050
INDM = 1	S5001060
SUMSY = 0.0	S5001070
C	S5001080
C*** BEGIN LOOP OVER MAJOR BOUNDARY LAYERS.	S5001090
C	S5001100
DO 210 ILK = 1,NLK	S5001110
NSOURC = 0	S5001120
ILKP3 = ILK + 3	S5001130
IF(NLK .EQ. 2) ILKP3 = MILK(ILK)	S5001140
JF = NLAYS + ILK	S5001150
IBOT = LAYBOT(ILK)	S5001160
C FOR SECOND BOUNDARY LAYER ADJUST BOTTOM LAYER INDEX TO	S5001170
C TOP OF FIRST BOUNDARY LAYER.	S5001180
IF(ILK .GT. 1) IBOT = LAYTOP(1) + 1	S5001190
ITOP = LAYTOP(ILK)	S5001200
ALTTOP = ALT(ITOP+1)	S5001210
30 CONTINUE	S5001220
C	S5001230
IF(IRUN .EQ. 4) WRITE(IOU,9001) ILK,XO,YO,IBOT,ITOP,DIRN(JF),	S5001240
1 SIGEPN(JF)	S5001250
C	S5001260
C** BEGIN LOOP OVER METEOROLOGICAL LAYERS WITHIN BOUNDARY LAYER.	S5001270
C	S5001280
DO 200 M = IBOT,ITOP	S5001290
GDEP = 0.0	S5001300
DO 40 J=1,NVS	S5001310
40 GDEPRT(J) = 0.0	S5001320
IF(IRUN .EQ. 4) WRITE(IOU,9006) M	S5001330
IF(Q(M) .LE. 0.0) GOTO 190	S5001340
C	S5001350
IF (.NOT.(DISCRT .OR. LOOP .GT. 0)) GO TO 50	S5001360
C* CALL SUBROUTINE TO COMPUTE CLOUD-RECEPTOR POSITION (XS,YS)	S5001370
C* AND DOWNWIND & CROSSWIND DISTANCES (X,Y).	S5001380
C	S5001390
A1 = DIRN(M)*RAD+PHIS(M)	S5001400
CALL COORD(A1,M,XO,YO,XS,YS,X,Y)	S5001410
C UPWIND?	S5001420
IF(IFLG .LT. 0) GOTO 190	S5001430
GO TO 60	S5001440
C	S5001450
C* ADJUST DOWNWIND & CROSSWIND DISTANCES DUE TO CLOUD INCLINATION.	S5001460
C RAD CONVERTS DEGREES TO RADIANS.	S5001470
50 PHISM = (DIRN(M)+180.0)*RAD + PHIS(M)	S5001480
IF(PHISM .GT. TWOPI) PHISM = PHISM - TWOPI	S5001490
IF(PHISM .LE. 0.0) PHISM = PHISM + TWOPI	S5001500
THETC = DY(M)*RAD	S5001510
SR = ABS(PHISM - THETC)	S5001520
IF (SR .GT. PI) SR = TWOPI-SR	S5001530

SR = ABS(PI-SR)	S5001540
AI = DX(M)	S5001550
SS = PI - (SR + ARSIN(AI*SIN(SR)/XOP))	S5001560
X = AI*AI + XO*XO - 2.0*AI*XO*COS(SS)	S5001570
IF(X .LE. 0.0) GOTO 190	S5001580
X = SQRT(X)	S5001590
SK = 1.0	S5001600
IF(ABS(PHISM - THETC) .GT. PI) SK = -1.0	S5001610
IF(PHISM .LT. THETC) SK = -1.0*SK	S5001620
Y = THETC + SK*SS	S5001630
IF(Y .LE. 0.0) Y = Y + TWOPI	S5001640
IF(Y .GT. TWOPI) Y = Y - TWOPI	S5001650
60 CONTINUE	S5001660
C	S5001670
C* CALL SUBROUTINE TO COMPUTE SIGMAS.	S5001680
C	S5001690
CALL SIGMA(X,M,JF,1,SIGAPK(M),SIGEPK(M),PHIS(M)*RADI)	S5001700
IF(SIGYNK .LE. 0.0) GOTO 190	S5001710
C	S5001720
C* COMPUTE LATERAL TERM FOR DISCRETE RECEPTORS.	S5001730
C	S5001740
IF(.NOT.(DISCRT .OR. LOOP.GT.0)) GOTO 70	S5001750
AI = Y/SIGYNK	S5001760
IF(ABS(AI) .GT. 10.0) GOTO 190	S5001770
ALAT = EXP(-.5*AI*AI)	S5001780
70 CONTINUE	S5001790
C	S5001800
C* INITIALIZE VARIABLES FOR MODEL EQUATIONS.	S5001810
C .70710678 = 1./SQRT(2)	S5001820
C	S5001830
UBARNL = UBARNK(M)	S5001840
UBARI = 1./UBARNL	S5001850
AI = BETA - 1.0	S5001860
IF(AI) 80,90,80	S5001870
80 SGEXS = 1./(SIGEPK(M)*X**BETA)	S5001880
BSEXS2 = BETA*SIGEPK(M)*X**AI*SQR2PI	S5001890
GOTO 100	S5001900
90 SGEXS = 1./(SIGEPK(M)*X)	S5001910
BSEXS2 = SIGEPK(M)*SQR2PI	S5001920
100 SGEXS2 = SGEXS*.70710678	S5001930
ALTM = ALT(M)	S5001940
ALTM1 = ALT(M+1)	S5001950
QAS = Q(M)/((ALTM1-ALTM)*SIGYNK)	S5001960
VSSUM = 0.0	S5001970
C	S5001980
C* BEGIN SUMMATION OVER SETTLING VELOCITY CATEGORIES.	S5001990
C	S5002000
DO 140 J = 1,NVS	S5002010
VS1 = VS(J)	S5002020
VJXSUL = VS1*X*UBARI	S5002030
GAMMA = GAMMAP(J)	S5002040
GDEPRT(J) = 0.0	S5002050

C		S5002060
C*	COMPUTE FIRST TERMS FOR MK + NK (BMPBN).	S5002070
C		S5002080
	A1 = (ALTM1-VJXSUL)*SGEXS2	S5002090
	A2 = (ALTM-VJXSUL)*SGEXS2	S5002100
	A3 = ERFXS(A1,A2)	S5002110
	A4 = (ALTM1-VJXSUL)*SGEXS	S5002120
	A4 = TEXP(A4)	S5002130
	A5 = (ALTM-VJXSUL)*SGEXS	S5002140
	A5 = TEXP(A5)	S5002150
C		S5002160
	BMPBN = VS1*.5*UBARI*A3 - BSEXS2*(A4-A5)	S5002170
C		S5002180
C		S5002190
C		S5002200
	IF(IRUN.EQ.4) WRITE(IOU,9002) J,M,XS,YS,X,Y,DIRN(M),SIGYNK,ALAT,	S5002210
	1 UBARI,VJXSUL,SGEXS,BSEXS2,SGEXS2,ALTM,ALTM1,A1,A2,A3,A4,A5,BMPBN	S5002220
C		S5002230
C*	COMPUTE SUMMATION TERM FOR MK + NK (BMPBN).	S5002240
C		S5002250
	AI = 2.0	S5002260
	GAM = 1.0	S5002270
	SAALT = AI*ALTTOP	S5002280
	SUM = 0.0	S5002290
	FIRST = .TRUE.	S5002300
C		S5002310
	110 CONTINUE	S5002320
	A1 = SAALT - ALTM1 + VJXSUL	S5002330
	A2 = SAALT - ALTM + VJXSUL	S5002340
	A11 = A1*SGEXS2	S5002350
	A21 = A2*SGEXS2	S5002360
	A3 = ERFXS(A11,A21)	S5002370
	A4 = A1*SGEXS	S5002380
	A4 = TEXP(A4)	S5002390
	A5 = A2*SGEXS	S5002400
	A5 = TEXP(A5)	S5002410
	A6 = SAALT + ALTM1 - VJXSUL	S5002420
	A7 = SAALT + ALTM - VJXSUL	S5002430
	A61 = A6*SGEXS2	S5002440
	A71 = A7*SGEXS2	S5002450
	A8 = ERFXS(A61,A71)	S5002460
	A9 = A6*SGEXS	S5002470
	A9 = TEXP(A9)	S5002480
	A10 = A7*SGEXS	S5002490
	A10 = TEXP(A10)	S5002500
C		S5002510
	SUM = SUM + GAM*(VS1*.5*UBARI*A3 + BSEXS2*(A4-A5)	S5002520
	1 + GAMMA*(VS1*.5*UBARI*A8 - BSEXS2*(A9-A10)))	S5002530
C		S5002540
	IF(FIRST) GOTO 120	S5002550
	IF(ABS(SUM-SUML) .LT. 1.E-6) GOTO 130	S5002560
	120 SUML = SUM	S5002570

AI = AI + 2.0	S5002580
SAALT = AI*ALTTOP	S5002590
GAM = GAM*GAMMA	S5002600
FIRST = .FALSE.	S5002610
GOTO 110	S5002620
130 A1 = BMPBN + SUM	S5002630
IF(A1 .LE. 0.0) GOTO 140	S5002640
A2 = (1.0-GAMMAP(J))*FS(J)*A1	S5002650
VSSUM = VSSUM + A2	S5002660
GDEPRT(J) = A2*DBARI3(J)*QAS	S5002670
IF(IRUN .EQ. 4) WRITE(IOU,9005) J,M,SUM,VSSUM,A1,A2,DBARI3(J),	S5002680
1 GDEPRT(J)	S5002690
140 CONTINUE	S5002700
C	S5002710
C* COMPUTE FINAL TERMS FOR MK + NK AND GRAV. DEP.	S5002720
C	S5002730
GDEP = QAS*VSSUM	S5002740
IF(.NOT.(DISCRT .OR. LOOP.GT.0)) GOTO 160	S5002750
GDEP = GDEP*ALAT	S5002760
DO 150 J = 1,NVS	S5002770
150 GDEPRT(J) = GDEPRT(J)*ALAT	S5002780
160 IF(GDEP .LE. 0.0) GOTO 180	S5002790
CI(INDM) = GDEP	S5002800
DO 170 J = 1,NVS	S5002810
170 GDEPNM(J,INDM) = GDEPRT(J)	S5002820
SIGYI(INDM) = SIGYNK	S5002830
SUMSY = SUMSY + SIGYNK	S5002840
YPI(INDM) = Y	S5002850
NSOURC = NSOURC + 1	S5002860
INDM = INDM + 1	S5002870
180 CONTINUE	S5002880
C	S5002890
C	S5002900
C	S5002910
190 IF(IRUN .EQ. 4) WRITE(IOU,9003) LOOP,VSSUM,Q(M),QAS,SIGYNK,GDEP	S5002920
1 , (GDEPRT(J),J=1,NVS)	S5002930
C* END OF MET. & MAJOR BOUNDARY LAYER LOOPS.	S5002940
200 CONTINUE	S5002950
IF(ILK .EQ. 1) AVGSY(1) = SUMSY/NSOURC	S5002960
210 CONTINUE	S5002970
AVGSY(2) = SUMSY/(INDM-1)	S5002980
IF(LOOP .NE. 0) GOTO 250	S5002990
C	S5003000
C** GET GRAVITATIONAL DEPOSITION OVER ALL MET. LAYERS.	S5003010
C** FOR MAX. CENTERLINE, COMPUTE MAXIMUM VALUE AND LOCATION.	S5003020
C** FOR DISCRETE, SUM GRAV. DEP. OVER ALL MET. LAYERS.	S5003030
C	S5003040
IF(INDM .LT. 2) GOTO 430	S5003050
IF(DISCRT) GOTO 340	S5003060
C	S5003070
C* CALL SUBROUTINES TO FIND MAXIMUM VALUE AND LOCATION	S5003080
C* OVER BOUNDARY LAYER.	S5003090

C	N = INDM - 1	S5003100
	CALL CROSS(YPI,N)	S5003110
	DO 220 I = 1,N	S5003120
220	YPI(I) = YPI(I)*XO	S5003130
	ILK = 1	S5003140
	IF (NLK .EQ. 1) NSOURC = 0	S5003150
	N = INDM - NSOURC - 1	S5003160
230	CALL REODR(CI,YPI,SIGYI,GDEPNM,1,N,NVS)	S5003170
C		S5003180
	CALL GDEPR(CI,YPI,SIGYI,N,GDEP,YMCL(ILK))	S5003190
	IF(ILK .EQ. 2.OR.NLK.EQ.1) GOTO 240	S5003200
	ILK = 2	S5003210
	N = INDM - 1	S5003220
	GOTO 230	S5003230
C**	LOOP-BACK LOGIC. GO BACK AND CALCULATE EXACT RESULTS AT	S5003240
C**	MAXIMUM LOCATION.	S5003250
240	LOOP = 1	S5003260
	YO = YMCL(1)/XOP*RADI	S5003270
	GOTO 10	S5003280
250	IF(LOOP .NE. 1) GOTO 290	S5003290
C**	SUM RESULTS FOR LAYER 1.	S5003300
	IF (NLK .EQ. 1) NSOURC = 0	S5003310
	N = INDM - NSOURC - 1	S5003320
	ILKP3 = 4	S5003330
	IF(NLK .EQ. 2) ILKP3 = 5	S5003340
	GDEP = 0.0	S5003350
	DO 260 M = 1,N	S5003360
260	GDEP = GDEP + CI(M)	S5003370
	GDEPP = 0.0	S5003380
	DO 280 J = 1,NVS	S5003390
	GDEPP1(J) = 0.0	S5003400
	DO 270 M = 1,N	S5003410
270	GDEPP1(J) = GDEPP1(J) + GDEPNM(J,M)*SQR2PI*AL203	S5003420
280	GDEPP = GDEPP + GDEPP1(J)	S5003430
	GOTO 330	S5003440
290	CONTINUE	S5003450
C**	SUM RESULTS FOR LAYER 2.	S5003460
	N = INDM - 1	S5003470
	ILKP3 = 5	S5003480
	IF(NLK .EQ. 2) ILKP3 = 4	S5003490
	GDEP = 0.0	S5003500
	DO 300 M = 1,N	S5003510
300	GDEP = GDEP + CI(M)	S5003520
	GDEPP = 0.0	S5003530
	DO 320 J = 1,NVS	S5003540
	GDEPP2(J) = 0.0	S5003550
	DO 310 M = 1,N	S5003560
310	GDEPP2(J) = GDEPP2(J) + GDEPNM(J,M)*SQR2PI*AL203	S5003570
320	GDEPP = GDEPP + GDEPP2(J)	S5003580
C		S5003590
C*	STORE RESULTS IN ARRAYS. FOR TWO LAYERS, SUM IS IN INDEX 4 &	S5003600
		S5003610

C*	LAYER 1 IS IN INDEX 5. FOR ONE LAYER, LAYER 1 IS IN INDEX 4.	S5003620
C*	SUBTRACT 3 FROM THIS INDEX FOR PARTICLE RESULTS.	S5003630
C		S5003640
330	VALUES(IXS,ILKP3) = GDEP*1000.0*SQR2PI*AL203	S5003650
	ILKPM3 = ILKP3 - 3	S5003660
	VALUES(IXS,ILKPM3) = GDEPP	S5003670
	SIGYBR(IXS,ILKP3) = AVGSY(LOOP)	S5003680
	SIGYBR(IXS,ILKPM3) = AVGSY(LOOP)	S5003690
C	RANGE.	S5003700
	RANGE(IXS,ILKP3) = XO	S5003710
	RANGE(IXS,ILKPM3) = XO	S5003720
C	BEARING.	S5003730
	IF(YO .GT. 360.0) YO = YO - 360.0	S5003740
	IF(YO .LE. 0.0) YO = YO + 360.0	S5003750
	BEARNG(IXS,ILKP3) = YO	S5003760
	BEARNG(IXS,ILKPM3) = YO	S5003770
	IF(IRUN .EQ. 4) WRITE(IOU,9007) LOOP,ILKP3,GDEP,GDEPP,XO,YO,	S5003780
1	AVGSY(LOOP)	S5003790
	IF(LOOP .EQ. 2.OR.NLK.EQ.1) GOTO 420	S5003800
	LOOP = 2	S5003810
	IF(ABS(YMCL(2) - YMCL(1)) .LT. 1.E-3) GOTO 290	S5003820
	YO = YMCL(2)/XOP*RADI	S5003830
	GOTO 10	S5003840
C		S5003850
C*	DISCRETE RECEPTOR LOGIC.	S5003860
C*	SUM GRAV. DEP. OVER ALL MET LAYERS AND STORE RESULTS.	S5003870
C*	INDEX 1 = LAYER ONE, 2 = LAYER TWO,	S5003880
C*	INDEX 3 = PARTICLES LAYER ONE, 4 = PARTICLES LAYER TWO.	S5003890
C		S5003900
340	N = INDM - NSOURC - 1	S5003910
	IF (NLK .EQ. 1) N = INDM-1	S5003920
	GDEP = 0.0	S5003930
	DO 350 I = 1,N	S5003940
350	GDEP = GDEP + CI(I)	S5003950
	GDEPP = 0.0	S5003960
	DO 370 J = 1,NVS	S5003970
	GDEPP1(J) = 0.0	S5003980
	DO 360 M = 1,N	S5003990
360	GDEPP1(J) = GDEPP1(J) + GDEPNM(J,M)*SQR2PI*AL203	S5004000
370	GDEPP = GDEPP + GDEPP1(J)	S5004010
	BUFDIS(1) = GDEP*1000.0*SQR2PI*AL203	S5004020
	BUFDIS(3) = GDEPP	S5004030
	IF (NLK .EQ. 1) GO TO 420	S5004040
	N = INDM - 1	S5004050
	GDEP = 0.0	S5004060
	DO 380 I = 1,N	S5004070
380	GDEP = GDEP + CI(I)	S5004080
	GDEPP = 0.0	S5004090
390	DO 410 J = 1,NVS	S5004100
	GDEPP2(J) = 0.0	S5004110
	DO 400 M = 1,N	S5004120
400	GDEPP2(J) = GDEPP2(J) + GDEPNM(J,M)*SQR2PI*AL203	S5004130

410	GDEPP = GDEPP + GDEPP2(J)	S5004140
	BUFDIS(2) = GDEP*1000.0*SQR2PI*AL203	S5004150
	BUFDIS(4) = GDEPP	S5004160
C		S5004170
C		S5004180
420	IF(IRUN .EQ. 4) WRITE(IOU,9004) IXS,INDM,NSOURC,AVGSY,YMCL,AL203,	S5004190
1	GDEP,GDEPP,(VALUES(IXS,J),J=1,6),(BEARNG(IXS,J),J=1,6)	S5004200
430	CONTINUE	S5004210
C		S5004220
C***	RETURN	S5004230
C		S5004240
	RETURN	S5004250
C		S5004260
CF**	FORMAT STATEMENTS.	S5004270
CF		S5004280
9001	FORMAT(52H0 DIAGNOSTICS FOR MAJOR BOUNDARY LAYER AND LOCATION:,I6,	S5004290
1	2F10.3/24H IBOT,ITOP,DIRN,SIGEPN=,2I6,1P2E12.5)	S5004300
9002	FORMAT(47H FIRST TERMS FOR MK + NK FOR SETTLING CATEGORY,I3,	S5004310
1	12H, MET. LAYER,I3/33H XS,YS,X,Y,DIRN(M),SIGYNK,ALAT =,1P7E12.5/	S5004320
2	35H UBARI,VJXSUL,SGEXS,BSEX2,SGEXS2=,5E12.5/	S5004330
3	34H ALTM,ALTM1,A1,A2,A3,A4,A5,BMPBN=,8E12.5)	S5004340
9003	FORMAT(41H LOOP,VSSUM,Q(M),QAS,SIGYNK,GDEP/GDEPP =,I4,1P5E13.5/	S5004350
1	(10E13.5))	S5004360
9004	FORMAT(18H RESULTS FOR RANGE,I3,15H INDM,NSOURC =,2I6/	S5004370
1	41H AVGSY(1-2),YMCL(1-2),AL203,GDEP,GDEPP =,1P7E12.5/	S5004380
2	15H VALUES(1-6) =,6E13.5/15H BEARNG(1-6) =,6E13.5)	S5004390
9005	FORMAT(45H FINAL SUMMATION TERMS FOR SETTLING CATEGORY,I3,	S5004400
1	12H, MET. LAYER,I3/32H SUM,VSSUM,A1,A2,DBARI3,GDEPP =,1P6E12.5)	S5004410
9006	FORMAT(19H0*** FOR MET. LAYER,I3)	S5004420
9007	FORMAT(50H GRDEP-STORED-LOOP,ILKP3,GDEP,GDEPP,XO,YO,AVGSY =,2I4,	S5004430
1	1P5E13.5)	S5004440
	END	S5004450

SUBROUTINE GDEPR(CI,YPI,SIGYI,NSOURC,RCHI,RYC)	S5100000
. , UPDATE: 8213 SOURCE: 16 DEC 81 LOCATION: KSC	S5100010
C-----	S5100020
C	S5100030
C THIS SUBROUTINE CALCULATES THE MAXIMUM CENTERLINE	S5100040
C GRAVITATIONAL DEPOSITION.	S5100050
C	S5100060
C-----	S5100070
C	S5100080
C DIMENSION CI(1),SIGYI(1),YPI(1)	S5100090
C	S5100100
C ISTR= 1	S5100110
C RCHI=0.0	S5100120
C RY=0.0	S5100130
C-----CALCULATE THE NUMBER OF SOURCES IN A GROUP	S5100140
10 SMIN=SIGYI(ISTR)	S5100150
I=ISTR	S5100160
20 IF(I.GT.NSOURC) GO TO 120	S5100170
IF(I.EQ.NSOURC) GO TO 30	S5100180
J=I+1	S5100190
TMP1=YPI(I)-YPI(J)	S5100200
TMP2=1.18*(SIGYI(I)+SIGYI(J))	S5100210
IF(TMP1.GT.TMP2) GO TO 30	S5100220
I=I+1	S5100230
GO TO 20	S5100240
30 CONTINUE	S5100250
SMIN=SIGYI(ISTR)	S5100260
IF(ISTR.EQ.NSOURC) GO TO 50	S5100270
IF(ISTR.EQ.I) GO TO 50	S5100280
DO 40 M=ISTR+1,I	S5100290
40 SMIN=AMIN1(SMIN,SIGYI(M))	S5100300
50 YINC=.08*SMIN	S5100310
YY=YPI(ISTR)	S5100320
60 YCHI=0.0	S5100330
IF(YY.LT.YPI(I)) GO TO 100	S5100340
DO 70 M=1,NSOURC	S5100350
EX=(YY-YPI(M))/SIGYI(M)	S5100360
YCHI=YCHI+CI(M)*TEXP(EX)	S5100370
70 CONTINUE	S5100380
80 IF(YCHI.LT.RCHI) GO TO 90	S5100390
RCHI=YCHI	S5100400
RYC = YY	S5100410
90 YY=YY-YINC	S5100420
GO TO 60	S5100430
100 CONTINUE	S5100440
110 ISTR=I+1	S5100450
GO TO 10	S5100460
120 IF(RCHI.LE.0.0) RYC = 0.0	S5100470
RETURN	S5100480
END	S5100490

	SUBROUTINE REODR(CI,YBAR,SIGYI,GDEP,IFR,ITO,NVS)	S5200000
	, UPDATE: 8213 SOURCE: 16 DEC 81 LOCATION: KSC	S5200010
C	THIS ROUTINE REORDERS THE SOURCE CLOUD VALUES BASED ON DESCENDING	S5200020
C	YBAR.	S5200030
C		S5200040
	DIMENSION CI(1),YBAR(1),SIGYI(1),GDEP(10,1)	S5200050
C		S5200060
C		S5200070
	IF(ITO-IFR.LT. 1) RETURN	S5200080
	DO 20 I = IFR,ITO-1	S5200090
	DO 20 J = I+1,ITO	S5200100
	IF(YBAR(I).GT. YBAR(J)) GOTO 20	S5200110
	A1 = YBAR(I)	S5200120
	YBAR(I) = YBAR(J)	S5200130
	YBAR(J) = A1	S5200140
	A1 = SIGYI(I)	S5200150
	SIGYI(I) = SIGYI(J)	S5200160
	SIGYI(J) = A1	S5200170
	A1 = CI(I)	S5200180
	CI(I) = CI(J)	S5200190
	CI(J) = A1	S5200200
	DO 10 N = 1,NVS	S5200210
	A1 = GDEP(N,I)	S5200220
	GDEP(N,I) = GDEP(N,J)	S5200230
01	10 GDEP(N,J) = A1	S5200240
	20 CONTINUE	S5200250
	RETURN	S5200260
	END	S5200270

REEDM SOURCE MODULE &RSUBM

FTN4	S5300000
SUBROUTINE COORD(DIRCTN,L,XR,YR,XS,YS,X,Y)	S5300010
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S5300020
C-----	S5300030
C	S5300040
C THIS SUBROUTINE TRANSLATES AND ROTATES THE AXIS TO MAKE THE MEAN	S5300050
C WIND DIRECTION THE POSITIVE X AXIS	S5300060
C	S5300070
C-----	S5300080
Cc	S5300090
C**** B E G I N C O M M O N A R E A ****	S5300100
C 04/02/82	S5300110
C-----MATH PARAMETERS AND CONSTANTS	S5300120
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S5300130
C-----INPUT OPTIONS	S5300140
REAL LAMBDA	S5300150
INTEGER FILE,GOOD,TITLE	S5300160
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S5300170
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S5300180
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S5300190
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S5300200
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S5300210
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S5300220
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S5300230
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S5300240
. FS(20),MDLNAM(12),DBAR(20)	S5300250
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES.	S5300260
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S5300270
. MODEL4,MODEL5,MODEL6	S5300280
INTEGER RUNNUM,RT,CL,CS	S5300290
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S5300300
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S5300310
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S5300320
. ,MIXING,MAXDEP,LAYBOT(3)	S5300330
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S5300340
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S5300350
. MINUS1,MINUS9,MINS1,MINS9,	S5300360
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S5300370
. RT(24),TPROPC,IDXRT	S5300380
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S5300390
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S5300400
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S5300410
. CLRLNE,INSLNE,DELIN	S5300420
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S5300430
. INVNDR(2),ULINE(2),	S5300440
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S5300450
. CLRLNE,INSLNE,DELIN,	S5300460
. IESCAJ(3),NULL,IBLNK,	S5300470
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S5300480
C-----VEHICLE PARAMETERS	S5300490

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COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRCT/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
RH(30),PTMP(30),SIGEP(30),SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
SIGYO(29)
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4),QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE (IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))
, (IPU2,IPAR(4)),(IPU3,IPAR(5))
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)
C
C
C**** END OF COMMON AREA ****
C
IFLG=0
RAD = PI/180.0
B=AMOD(YR,360.0)*RAD
XP=XR*SIN(B)
YP=XR*COS(B)
B=COS(DIRCTN)
A=SIN(DIRCTN)
C=DY(L)*RAD
XDX=DX(L)*SIN(C)
YDY=DX(L)*COS(C)
X1=XP-XDX
Y1=YP-YDY
X=-X1*A-Y1*B
Y=X1*B-Y1*A
IF(X.GT.0.0) GO TO 10
IFLG=-1
GO TO 20
10 XS=SQRT(X1*X1+Y1*Y1)
YS=0.0
IF(X1.EQ.0.0 .AND. Y1.EQ.0.0) GO TO 20

```

```
YS=(0.5*PI)-ATAN2(Y1,X1)
IF(YS.GE.0.0) GO TO 20
YS=YS+2.0*PI
20 RETURN
END
```

```
S5301020
S5301030
S5301040
S5301050
S5301060
```

SUBROUTINE SIGMA(XP,M,JF,ISIGMA,SIGAPP,SIGEPP,DDIRP)		S5400000
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC		S5400010
Cc		S5400020
C****	BEGIN COMMON AREA	****S5400030
C	04/02/82	S5400040
C-----	MATH PARAMETERS AND CONSTANTS	S5400050
	COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S5400060
C-----	INPUT OPTIONS	S5400070
	REAL LAMBDA	S5400080
	INTEGER FILE,GOOD,TITLE	S5400090
	COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S5400100
	ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S5400110
	XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S5400120
	IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S5400130
	ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S5400140
	,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S5400150
	,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S5400160
	TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S5400170
	FS(20),MDLNAM(12),DBAR(20)	S5400180
C-----	COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S5400190
	LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S5400200
	MODEL4,MODEL5,MODEL6	S5400210
	INTEGER RUNNUM,RT,CL,CS	S5400220
	COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S5400230
	DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S5400240
	SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S5400250
	,MIXING,MAXDEP,LAYBOT(3)	S5400260
	,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S5400270
	ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S5400280
	MINUS1,MINUS9,MINI1,MINI9,	S5400290
	MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S5400300
	RT(24),TPROPC,IDXRT	S5400310
C-----	TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S5400320
	INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S5400330
	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S5400340
	CLRLNE,INSLNE,DELNE	S5400350
	COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKG(2),INV(2),INVHF(2),	S5400360
	INVNDR(2),ULINE(2),	S5400370
	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S5400380
	CLRLNE,INSLNE,DELNE,	S5400390
	IESCAJ(3),NULL,IBLNK,	S5400400
	IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S5400410
C-----	VEHICLE PARAMETERS	S5400420
	COMMON /VCLPR/ VPAR(17)	S5400430
C-----	TIME PARAMETERS	S5400440
	COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	S5400450
	LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	S5400460
C-----	SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)	S5400470
	COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),	S5400480
	RH(30),PTMP(30),SIGEP(30),SIGAP(30)	S5400490
C-----	LAYER PARAMETERS	S5400500

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COMMON /LAYER/ DX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29),  S5400510
                  SIGYO(29)  S5400520
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)  S5400530
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6)  S5400540
C-----CALCULATED NEW LAYER PARAMETERS  S5400550
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32),  S5400560
                  SPEEDN(32)  S5400570
C-----CONVERSION FACTORS  S5400580
COMMON /CNVRT/ QCONV(4), QPDEPH  S5400590
C  S5400600
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S5400610
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)  S5400620
C-----READ/WRITE BUFFER  S5400630
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S5400640
C*****S5400650
C  S5400660
C-----EQUIVALENCE STATEMENTS-  S5400670
EQUIVALENCE(IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3))  S5400680
                  , (IPU2, IPAR(4)), (IPU3, IPAR(5))  S5400690
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT1, IFRMT1)  S5400700
DATA RAD/.01745329/  S5400710
C  S5400720
C**** END OF COMMON AREA *****S5400730
Cç
X = 0.0  S5400740
MMM = 1  S5400750
SIGZ=0.0  S5400760
SIGY = 0.0  S5400770
SIGX = 0.0  S5400780
A1 = 1.0  S5400790
A2 = SIGYO(M)  S5400800
A3 = SIGAPP  S5400810
B3 = SIGEPP  S5400820
A4 = ALPHA  S5400830
B4 = BETA  S5400840
A5 = DDIRP  S5400850
A6 = SIGXO(M)  S5400860
RL = 0.0  S5400870
IF(DSPEED(M).GT.0.0) RL = .28*X*DSPEED(M)/SPEEDN(M)  S5400880
N = 1  S5400890
10 IF((A4-1.0).EQ.0.0) GO TO 20  S5400900
A1 = 1.0/A4  S5400910
IF(MMM.EQ.2) GO TO 30  S5400920
IF((A2-A3*XRY).GT.0.0) GO TO 30  S5400930
20 XY = A2/A3  S5400940
GO TO 40  S5400950
30 XY = A4*XRY*(A2/(A3*XRY))**A1+XRY*(1.0-A4)  S5400960
40 IF(MMM.EQ.1) XY = XY-XLRY  S5400970
IF(XY.LT.0.0) XY = 0.0  S5400980
IF((A4-1.0).EQ.0.0) GO TO 50  S5400990
T1 = (X+XY-XRY*(1.0-A4))/(XRY*A4)  S5401000
IF(T1.LE.0.0) GO TO 70  S5401010
S5401020

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T1 = A3*XRY*T1**A4	S5401030
GO TO 60	S5401040
50 T1 = A3*(X+XY)	S5401050
60 T2 = ABS(A5)*X*4.0589052E-3	S5401060
SIGY = SQRT(T1*T1+T2*T2)	S5401070
70 SIGX=SQRT(RL*RL*.05408329+A6*A6)	S5401080
IF(N.EQ.1) GO TO 90	S5401090
IF((B4-1.0).EQ.0.0) GO TO 80	S5401100
T1 = X/XRZ	S5401110
IF (T1 .LT. 0.0) GO TO 90	S5401120
SIGZ = B3*XRZ*T1**B4	S5401130
GO TO 90	S5401140
80 XZ = X	S5401150
SIGZ = B3*XZ	S5401160
90 CONTINUE	S5401170
IF(MMM.EQ.2) GO TO 110	S5401180
N = 2	S5401190
X = XP	S5401200
MMM = 2	S5401210
T1 = (DIRN(M)-DIRN(JF))*RAD	S5401220
A1 = 1.0	S5401230
T2 = SIN(T1)	S5401240
T1 = COS(T1)	S5401250
A2 = SQRT((SIGX*T2)**2+(SIGY*T1)**2)	S5401260
IF(ISIGMA .EQ. 1) GOTO 100	S5401270
A3 = SIGAPN(JF)	S5401280
B3 = SIGEPN(JF)	S5401290
A5 = DDIR(JF)	S5401300
100 A4 = ALPHA	S5401310
B4 = BETA	S5401320
A6 = SQRT((SIGX*T1)**2+(SIGY*T2)**2)	S5401330
RL = 0.0	S5401340
IF(DSPEED(JF).GT.0.0) RL = .28*X*DSPEED(JF)/SPEEDN(JF)	S5401350
GO TO 10	S5401360
110 SIGXNK = SIGX	S5401370
SIGYNK = SIGY	S5401380
RETURN	S5401390
END	S5401400

	FUNCTION ERFXS(A,B)	S5500000
	. , UPDATE: 8213 SOURCE: 02 OCT 79 LOCATION: KSC	S5500010
C	-----	S5500020
C		S5500030
C	CALCULATE ERF(A) - ERF(B).	S5500040
C		S5500050
C	-----	S5500060
C		S5500070
C	HPL = LOWER LIMIT - HPU = UPPER LIMIT.	S5500080
C		S5500090
	LOGICAL DONE	S5500100
	DATA HPL,HPU / 1.E-10,5.0 /	S5500110
	ERF(X) = 1+X*(.705230784E-1+X*(.422820123E-1+X*(.92705272E-2+	S5500120
1	X*(.1520143E-3+X*(.2765672E-3+X*.430638E-4))))	S5500130
C		S5500140
	DONE = .FALSE.	S5500150
	C = A	S5500160
10	IF(C .LT. 0.0) GOTO 20	S5500170
	I = 0	S5500180
	GOTO 30	S5500190
20	I = 1	S5500200
	C = -C	S5500210
30	IF(C .GT. HPL) GOTO 40	S5500220
	F = 1.	S5500230
	GOTO 60	S5500240
40	IF(C .LT. HPU) GOTO 50	S5500250
	F = 0.0	S5500260
	GOTO 70	S5500270
50	F = ERF(C)	S5500280
	F = (1./F)**16	S5500290
60	IF(I .EQ. 1) F = -F	S5500300
70	IF(DONE) GOTO 80	S5500310
	C = B	S5500320
	G = F	S5500330
	DONE = .TRUE.	S5500340
	GOTO 10	S5500350
80	CONTINUE	S5500360
	ERFXS = F - G	S5500370
C	ONE'S WILL NOT CANCEL IF A & B ARE OPPOSITE IN SIGN	S5500380
	IF(A .LT. 0.0 .AND. B .GE. 0.0) ERFXS = ERFXS-2	S5500390
	IF(A .GE. 0.0 .AND. B .LT. 0.0) ERFXS = ERFXS+2	S5500400
	RETURN	S5500410
	END	S5500420

FUNCTION TEXP(A)	S5600000
. , UPDATE: 8213 SOURCE: 27 FEB 80 LOCATION: KSC	S5600010
C	S5600020
IF(ABS(A) .GT. 10.0) GOTO 10	S5600030
TEXP = EXP(-.5*A*A)	S5600040
RETURN	S5600050
10 TEXP = 0.0	S5600060
RETURN	S5600070
END	S5600080

	SUBROUTINE CROSS(A,N)	S5700000
	. , UPDATE: 8213 SOURCE: 10 NOV 81 LOCATION: KSC	S5700010
C	ROUTINE TO ELIMINATE CROSSOVER PROBLEMS	S5700020
	DIMENSION A(1)	S5700030
C		S5700040
	I = 1	S5700050
10	I = I+1	S5700060
	IF (I .GT. N) GO TO 30	S5700070
	IF (ABS(A(I)-A(I-1)) .LE. 3.141593) GO TO 10	S5700080
	IF (A(I) .GT. A(I-1)) GO TO 20	S5700090
	A(I) = A(I)+6.283185	S5700100
	GO TO 10	S5700110
20	A(I) = A(I)-6.283185	S5700120
	GO TO 10	S5700130
30	CONTINUE	S5700140
	RETURN	S5700150
	END	S5700160

	FUNCTION ARSIN(X)	S5800000
C	CALCULATES THE ARCSIN OF X	S5800010
C		S5800020
	IF (X .GT. 1.0) X = 1.0	S5800030
	IF (X .LT. -1.0) X = -1.0	S5800040
	ARSIN = 1.570796	S5800050
	IF (X-1.0) 10,20,10	S5800060
10	ARSIN = ATAN2(X,SQRT(1.0-X*X))	S5800070
20	RETURN	S5800080
	END	S5800090

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SUBROUTINE SHEAR(UBARNK,PHIS,SIGAPK,SIGEPK,IFCON)
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:.....S5900000
C:.....S5900010
C:.....S5900020
C:.....S5900030
C:.....S5900040
C:.....S5900050
C:.. PROGRAM DESCRIPTION:
C:.. THIS PROGRAM CALCULATES THE INCLINATION OF THE CLOUD AXIS
C:.. PHIS AND MEAN TRANSPORT WIND SPEED UBARNK FROM THE BOTTOM
C:.. OF THE LAYER CONTAINING THE CALCULATION HEIGHT TO THE TOP
C:.. OF THE SOUNDING.
C:.....S5900060
C:.....S5900070
C:.....S5900080
C:.....S5900090
C:.....S5900100
C:.....S5900110
C:.....S5900120
C:.....S5900130
C:.....S5900140
C:.....S5900150
C:.....S5900160
C****          B E G I N C O M M O N   A R E A
C          04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
.             ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
.             XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
.             IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
.             ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
.             ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)
.             ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
.             TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
.             FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,
.       MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
.             DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
.             SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP
.             ,MIXING,MAXDEP,LAYBOT(3)
.             ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
.             ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
.             MINUS1,MINUS9,MINUS1,MINUS9,
.             MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
.             RT(24),TPROPC,IDXRT
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
.       TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.       CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
.             INVNDR(2),ULINE(2),

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      .          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,S5900510
      .          CLRLNE,INSLNE,DELIN,S5900520
      .          IESCAJ(3),NULL,IBLNK,S5900530
      .          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)S5900540
C-----VEHICLE PARAMETERSS5900550
      COMMON /VCLPR/ VPAR(17)S5900560
C-----TIME PARAMETERSS5900570
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,S5900580
      .          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)S5900590
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)S5900600
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),S5900610
      .          RH(30),PTEMP(30),SIGEP(30),SIGAP(30)S5900620
C-----LAYER PARAMETERSS5900630
      COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),S5900640
      .          SIGYO(29)S5900650
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)S5900660
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)S5900670
C-----CALCULATED NEW LAYER PARAMETERSS5900680
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),S5900690
      .          SPEEDN(32)S5900700
C-----CONVERSION FACTORS S5900710
      COMMON /CNVRT/ QCONV(4),QPDEPHS5900720
C S5900730
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S5900740
      COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)S5900750
C-----READ/WRITE BUFFERS5900760
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S5900770
C*****S5900780
C S5900790
C-----EQUIVALENCE STATEMENTS S5900800
      EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))S5900810
      .          ,(IPU2,IPAR(4)),(IPU3,IPAR(5))S5900820
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)S5900830
C S5900840
C**** END OF COMMON AREA *****S5900850
Cq S5900860
C S5900870
      DIMENSION UBARNK(50),PHIS(50),SIGAPK(50),SIGEPK(50)S5900880
C S5900890
      DATA RAD/.01745329/S5900900
C S5900910
C S5900920
C S5900930
C S5900940
      B1 = 1.0S5900950
      SUMX = 0.0S5900960
      SUMY = 0.0S5900970
      SIGAL = 0.0S5900980
      SIGEL = 0.0S5900990
      IF (IRUN .EQ. 4) WRITE (IOU,9001)S5901000
      DO 60 M=1,NLAYS S5901010
      PHIS(M) = 0.0S5901020

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DZ = ALT(M+1) - ALT(M)	S5901030
SIGAL = SIGAL + SIGAPN(M)*DZ	S5901040
SIGEL = SIGEL + SIGEPN(M)*DZ	S5901050
SIGAPK(M) = SIGAL/ALT(M+1)*RAD	S5901060
SIGEPK(M) = SIGEL/ALT(M+1)*RAD	S5901070
IF(M .LT. IBOT.AND.IFCON .NE. 0) GOTO 60	S5901080
A0 = DDIR(M)*RAD	S5901090
IF (ABS(A0)-2.0E-3) 10,20,20	S5901100
10 A0 = 2.0E-3*B1	S5901110
20 IF (A0 .LT. 0.0) B1 = 1.0	S5901120
IF (A0 .GT. 0.0) B1 = -1.0	S5901130
UBDZ = SPEEDN(M)*DZ	S5901140
BK = A0/DZ	S5901150
A4 = UBDZ/A0	S5901160
BKS = BK*ALT(M)	S5901170
BKP = BK*(0.5*DZ+ALT(M))	S5901180
X22 = SIN(BKS)	S5901190
Y22 = COS(BKS)	S5901200
X2 = (SIN(BKP)-X22)*A4	S5901210
Y2 = (COS(BKP)-Y22)*A4	S5901220
XNK = SUMX + X2	S5901230
YNK = SUMY + Y2	S5901240
BKP = BK*ALT(M+1)	S5901250
X2 = (SIN(BKP)-X22)*A4	S5901260
Y2 = (COS(BKP)-Y22)*A4	S5901270
SUMX = SUMX+X2	S5901280
SUMY = SUMY+Y2	S5901290
IF(YNK) 40,30,40	S5901300
30 UBARNK(M) = XNK/(ALT(M)+DZ*.5)	S5901310
GOTO 50	S5901320
40 PHIS(M) = ATAN2(YNK,XNK)	S5901330
UBARNK(M) = SQRT(XNK*XNK + YNK*YNK)/(ALT(M)+DZ*.5)	S5901340
50 IF (IRUN .NE. 4) GO TO 60	S5901350
PHISP = PHIS(M)/RAD	S5901360
WRITE(10U,9002) M,A4,DZ,DDIR(M),SPEEDN(M),XNK,YNK,PHISP,	S5901370
1UBARNK(M)	S5901380
60 CONTINUE	S5901390
RETURN	S5901400
9001 FORMAT (1H0,12X,1HM,7X,2HA4,10X,2HDZ,8X,4HDDIR,10X,	S5901410
*6HSPEEDN,7X,3HXNK,8X,3HYNK,9X,4HPHIS,8X,6HUBARNK)	S5901420
9002 FORMAT(12X,I3,1X,8F12.3)	S5901430
END	S5901440

REEDM SOURCE MODULE &RCIMM

FTN4	S6000000
PROGRAM RCIMM(5,119)	S6000010
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S6000020
C**** DECLARATIONS.	S6000030
C	S6000040
Cc	S6000050
C**** BEGIN COMMON AREA	****S6000060
C 04/02/82	S6000070
C-----MATH PARAMETERS AND CONSTANTS	S6000080
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S6000090
C-----INPUT OPTIONS	S6000100
REAL LAMBDA	S6000110
INTEGER FILE,GOOD,TITLE	S6000120
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S6000130
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S6000140
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S6000150
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S6000160
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S6000170
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S6000180
. ,IPLINT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S6000190
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S6000200
. FS(20),MDLNAM(12),DBAR(20)	S6000210
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S6000220
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S6000230
. MODEL4,MODEL5,MODEL6	S6000240
INTEGER RUNNUM,RT,CL,CS	S6000250
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S6000260
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S6000270
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S6000280
. ,MIXING,MAXDEP,LAYBOT(3)	S6000290
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S6000300
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S6000310
. MINUS1,MINUS9,MINS1,MINS9,	S6000320
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S6000330
. RT(24),TPROPC,IDXRT	S6000340
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S6000350
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S6000360
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S6000370
. CLRLNE,INSLNE,DELINE	S6000380
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S6000390
. INVNDR(2),ULINE(2),	S6000400
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S6000410
. CLRLNE,INSLNE,DELINE,	S6000420
. IESCAJ(3),NULL,IBLNK,	S6000430
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S6000440
C-----VEHICLE PARAMETERS	S6000450
COMMON /VCLPR/ VPAR(17)	S6000460
C-----TIME PARAMETERS	S6000470
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	S6000480
. LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	S6000490

80 NNNEST = 1	S6001020
NNNTRY = 1	S6001030
90 CALL REEDM	S6001040
STOP	S6001050
9001 FORMAT (47H MOUNT A CENTERLINE PROFILE FORM ON PLOTTER LU ,I2/	S6001060
*28X,2A2,14HSPACE - RETURN,2A2,11H WHEN READY/	S6001070
*28X,6HENTER ,2A2,1HF,2A2,19H TO PLOT THE FORM:_)	S6001080
9002 FORMAT (3A2)	S6001090
9003 FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS	S6001100
* IF -1 TYPED AGAIN/)	S6001110
9004 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S6001120
*,I2,1H.,I1/)	S6001130
END	S6001140

	SUBROUTINE RCFRM(IPASS,CRT)	S6100000
	. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S6100010
	INTEGER ALTSET,OFF,BLNKNG,ULINE,TAB,TAB2,SETTAB,CLRTAB,CURSUP,	S6100020
1	CURSDN,CURLFT,CLRDSP,CLRLNE,DELIN	S6100030
	COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S6100040
	INVNDR(2),ULINE(2),	S6100050
	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S6100060
	CLRLNE,INSLNE,DELIN,	S6100070
	IESCAJ(3),NULL,IBLNK,	S6100080
	IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S6100090
	LOGICAL CRT	S6100100
	INTEGER SECNDS(3),EQUALS(2),BKARO,BKAKO,CR	S6100110
	COMPLEX XLGND(5),CH(2),TOR(2),TOL(2),BOL(2),HOC(2),SF(3)	S6100120
	. ,PRDT(3),LAUNCH(2),RL(2),DFN(2)	S6100130
	DIMENSION NUML(3),NUM(2),LGNDX(21),IBUFR(33),IPASS(2)	S6100140
	. ,LEGEND(98),METERS(2),IREG(2),IN(2)	S6100150
	EQUIVALENCE (NUML,NUMLI),(NUML(2),NUM),(LGNDX(2),XLGND)	S6100160
	. ,(IREG,REG,IA),(IREG(2),IB),(IN,IN1),(IPAR(1),IIU)	S6100170
	. ,(LEGEND(2),CH),(LEGEND(11),TOR),(LEGEND(20),TOL)	S6100180
	. ,(LEGEND(29),BOL),(LEGEND(38),HOC),(LEGEND(60),PRDT)	S6100190
	. ,(LEGEND(73),LAUNCH),(LEGEND(46),LGND1),(LEGEND(59),LGND2)	S6100200
	. ,(LEGEND(72),LGND3),(LEGEND(82),RL),(LEGEND(91),DFN)	S6100210
	. ,(LEGEND(81),LGND4),(LEGEND(90),LGND5),(LEGEND(47),SF)	S6100220
	. ,(IPAR(2),IOU)	S6100230
	DATA LEGEND(1),LEGEND(10),LEGEND(19),LEGEND(28),LEGEND(37)	S6100240
	. ,LEGEND(46),LEGEND(59),LEGEND(72),LEGEND(81),LEGEND(90)	S6100250
	. ,LGNDX(1)	S6100260
	. /12,12,12,15,14,18,18,12,13,14,40/	S6100270
	DATA CH/8HCLOUD HE,8HIGHT /,TOR/8HTIME OF ,8HRISE /	S6100280
	. ,TOL/8HTOP OF L,8HAYER /,BOL/8HBOTTOM O,8HF LAYER /	S6100290
	. ,HOC/8HHEIGHT O,8HF CALC /,SF/8HSOUNDING,8H/FORECAS	S6100300
	. ,8HT: /,PRDT/8HTIME OF ,8HEXECUTIO,8HN: /	S6100310
	. ,LAUNCH/8HLAUNCH T,8HIME: /	S6100320
	. ,RL/8HRUN LOCA,8HTION: /,DFN/8HDATA FIL,8HENAME: /	S6100330
	DATA METERS/1,1HM/,SECNDS/3,2HSE,2HC /,EQUALS/1,1H=/	S6100340
	DATA XLGND/8H DISTANC,8HE FROM C,8HLOUD STA,8HBILIZATI	S6100350
	. ,8HON (KM) /,IN1/1H@/	S6100360
	DATA CR,BKARO,BKAKO/15B,20137B,137B/	S6100370
C		S6100380
C	FIRST EXECUTABLE STATEMENT	S6100390
C		S6100400
	IF (CRT) GO TO 10	S6100410
	CR = NULL	S6100420
	BKARO = NULL	S6100430
	BKAKO = IBLNK	S6100440
10	IPU2=IPASS(1)	S6100450
	IN1=IAND(IPASS(2),177400B)+40B	S6100460
	IF (IIU.EQ. 99) CALL LURQ(1,IPU2,1)	S6100470
20	CALL PLTLU(IPU2)	S6100480
C		S6100490
C	PLOT SIZE IN CM	S6100500

C	CALL SFACT(33.0,24.0)	S6100510
	CALL LLEFT	S6100520
	30 WRITE(ICU,9001) BLNKNG,OFF,BKARO	S6100530
	9001 FORMAT(10X,2A2,15HFORM GENERATION,3A2)	S6100540
C		S6100550
C	MARK LOWER LEFT	S6100560
C		S6100570
	CALL PLOT(0.2,0.0,2)	S6100580
	CALL PLOT(0.0,0.0,2)	S6100590
	CALL PLOT(0.0,0.2,2)	S6100600
C		S6100610
C	PLOTTER NOW SET UP:: LABEL X-AXIS	S6100620
C		S6100630
	X=2.26	S6100640
	NUMLI=2	S6100650
	DO 40 I=0,30	S6100660
	CALL CODE	S6100670
	WRITE(NUM,9002) I	S6100680
	9002 FORMAT(I2)	S6100690
	CALL SYMB(X+FLOAT(I),1.8,0.2,NUML,0.0,1)	S6100700
	40 CONTINUE	S6100710
C		S6100720
C	DRAW X-AXIS W/TICS	S6100730
C		S6100740
	CALL PLOT(32.5,2.2,3)	S6100750
	CALL PLOT(32.5,2.5,2)	S6100760
	DO 50 I=29,0,-1	S6100770
	FI=2.5+FLOAT(I)	S6100780
	CALL PLOT(FI,2.5,2)	S6100790
	CALL PLOT(FI,2.2,2)	S6100800
	CALL PLOT(FI,2.5,2)	S6100810
	50 CONTINUE	S6100820
	CALL PLOT(FI,2.5,3)	S6100830
	CALL SYMB(13.5,1.3,0.2,LGNDX,0.0,1)	S6100840
C		S6100850
C	BEGIN LEGEND	S6100860
C		S6100870
	CALL SYMB(16.7,20.5,0.2,LGND5,0.0,1)	S6100880
	CALL SYMB(16.7,21.0,0.2,LGND4,0.0,1)	S6100890
	CALL SYMB(16.7,21.5,0.2,LGND3,0.0,1)	S6100900
	CALL SYMB(16.7,22.0,0.2,LGND2,0.0,1)	S6100910
	CALL SYMB(16.7,22.5,0.2,LGND1,0.0,1)	S6100920
C		S6100930
C	UNITS	S6100940
C		S6100950
	CALL SYMB(14.7,22.5,0.2,METERS,0.0,1)	S6100960
	CALL SYMB(14.7,22.0,0.2,SECNDS,0.0,1)	S6100970
	CALL SYMB(14.7,21.5,0.2,METERS,0.0,1)	S6100980
	CALL SYMB(14.7,21.0,0.2,METERS,0.0,1)	S6100990
	CALL SYMB(14.7,20.5,0.2,METERS,0.0,1)	S6101000
C		S6101010
		S6101020

C	EQUALS	S6101030
C		S6101040
	FI=20.0	S6101050
	DO 60 I=1,5	S6101060
	FI=FI+0.5	S6101070
	CALL SYMB(11.9,FI,0.2,EQUALS,0.0,1)	S6101080
	60 CONTINUE	S6101090
C		S6101100
C	MORE LEGEND	S6101110
C		S6101120
	DO 70 I=1,37,9	S6101130
	CALL SYMB(7.7,FI,0.2,LEGEND(I),0.0,1)	S6101140
	FI=FI-0.5	S6101150
	70 CONTINUE	S6101160
C		S6101170
C	MARK UPPER RIGHT	S6101180
C		S6101190
	CALL PLOT(33.0,23.8,3)	S6101200
	CALL PLOT(33.0,24.0,2)	S6101210
	CALL PLOT(32.8,24.0,2)	S6101220
	CALL PLOT(33.0,24.0,3)	S6101230
C		S6101240
C	REMOVE "FORM GENERATION"	S6101250
C		S6101260
	CALL URITE	S6101270
	WRITE(ICU,9003) CR,CLRDSP,BKAKO	S6101280
	9003 FORMAT(50A2)	S6101290
C		S6101300
C	CHECK FOR "F"	S6101310
C		S6101320
	IF(IN1.EQ.1HF) GO TO 90	S6101330
	80 WRITE(ICU,9004) BLNKNG,OFF,INVNDR,INV,OFF,ULINE,OFF,BKARO	S6101340
	9004 FORMAT(53H DO YOU WANT TO PLOT ANOTHER CENTERLINE PROFILE FORM?	S6101350
	. /5X,2A2,30HCHANGE PLOT PAPER BEFORE A YES,2A2	S6101360
	. ,14X,1H(,2A2,1HY,2A2,2HES,2A2,4H OR ,2A2,1HN,2A2,2HO),A2)	S6101370
	IN1 = IBLNK	S6101380
	READ (ICU,9005) IN1	S6101390
	WRITE(ICU,9003) CURSUP,CURSUP,CR,CLRDSP,BKAKO	S6101400
	IF(IN1.EQ.IYSJ.OR.IN1.EQ.IBLNK.OR.IN1.EQ.IYESJ) GO TO 30	S6101410
	IF (IN1 .EQ. INJ.OR.IN1 .EQ. INOJ) GO TO 90	S6101420
	WRITE (ICU,9006) INV,OFF,0,0	S6101430
	GO TO 80	S6101440
	9005 FORMAT (A2)	S6101450
	9006 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S6101460
	*,I2,1H.,I1/)	S6101470
	90 CONTINUE	S6101480
	RETURN	S6101490
	END	S6101500

REEDM SOURCE MODULE &RCIMN

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FTN4
SUBROUTINE RISOM
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6200010
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6200020
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6200030
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6200040
C::: :::: S6200050
C::: :::: S6200060
C::: ORGANIZATION: H. E. CRAMER CO., INC. :::: S6200070
C::: :::: S6200080
C::: WORK FOR: DR. J. B. STEPHENS (ES84) :::: S6200090
C::: :::: S6200100
C::: PROGRAM CODE: RISOM :::: S6200110
C::: :::: S6200120
C::: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST :::: S6200130
C::: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER) :::: S6200140
C::: :::: S6200150
C::: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS :::: S6200160
C::: :::: S6200170
C::: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS :::: S6200180
C::: :::: S6200190
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6200200
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6200210
C S6200220
C *****S6200230
C * S6200240
C * ISOPLETH PLOTTING PROGRAM -- A PROGRAM IN THE REED SERIES *S6200250
C * OF PROGRAMS *S6200260
C * *S6200270
C *****S6200280
Cq S6200290
C**** BEGIN COMMON AREA ****S6200300
C 04/02/82 S6200310
C-----MATH PARAMETERS AND CONSTANTS S6200320
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S6200330
C-----INPUT OPTIONS S6200340
REAL LAMBDA S6200350
INTEGER FILE,GOOD,TITLE S6200360
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S6200370
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S6200380
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S6200390
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S6200400
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S6200410
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S6200420
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S6200430
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S6200440
. FS(20),MDLNAM(12),DBAR(20) S6200450
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S6200460
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S6200470
. MODEL4,MODEL5,MODEL6 S6200480
INTEGER RUNNUM,RT,CL,CS S6200490

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COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,      S6200500
.      DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,          S6200510
.      SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP                    S6200520
.      ,MIXING,MAXDEP,LAYBOT(3)                                S6200530
.      ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,             S6200540
.      ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),            S6200550
.      MINUS1,MINUS9,MIN51,MIN59,                              S6200560
.      MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,      S6200570
.      RT(24),TPROPC,IDXRT                                     S6200580
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S6200590
      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,              S6200600
.      TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,    S6200610
.      CLRLNE,INSLNE,DELNE                                     S6200620
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),    S6200630
.      INVNDR(2),ULINE(2),                                     S6200640
.      TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,    S6200650
.      CLRLNE,INSLNE,DELNE,                                    S6200660
.      IESCAJ(3),NULL,IBLNK,                                   S6200670
.      IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)              S6200680
C-----VEHICLE PARAMETERS                                     S6200690
COMMON /VCLPR/ VPAR(17)                                       S6200700
C-----TIME PARAMETERS                                       S6200710
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,     S6200720
.      LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)           S6200730
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S6200740
COMMON /FRCT/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),   S6200750
.      RH(30),PTEMP(30),SIGEP(30),SIGAP(30)                   S6200760
C-----LAYER PARAMETERS                                       S6200770
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S6200780
.      SIGYO(29)                                                S6200790
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)           S6200800
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)                     S6200810
C-----CALCULATED NEW LAYER PARAMETERS                       S6200820
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S6200830
.      SPEEDN(32)                                               S6200840
C-----CONVERSION FACTORS                                     S6200850
COMMON /CNVRT/ QCONV(4),QPDEPH                                 S6200860
C                                                                S6200870
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S6200880
COMMON /EXTRA/      NCOM(1),      NTOTAL(1),      PLUS(900)    S6200890
C-----READ/WRITE BUFFER                                     S6200900
C-----A R R A Y   = 2077 + 1      + 1      + 2 * 900      = 3879S6200910
C*****S6200920
C                                                                S6200930
C-----EQUIVALENCE STATEMENTS                                S6200940
      EQUIVALENCE (IPU1,IPAR(3))                                S6200950
.      , (IPU2,IPAR(4)), (IPU3,IPAR(5))                        S6200960
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)          S6200970
C                                                                S6200980
C****      E N D   O F   C O M M O N   A R E A                ****S6200990
C                                                                S6201000
C                                                                S6201010

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INTEGER ZIP,FIRSTV	S6201020
DIMENSION RANGE(30,6),BEARNG(30,6),SIGYBR(30,6),CORSG(30,6)	S6201030
. ,XCORSG(6),ZIP(5),MTH(4,8),NFSLS(3,9)	S6201040
LOGICAL TMOUT,TO,FIRSTP	S6201050
COMPLEX RBORSG(6)	S6201060
C-----EQUIVALENCE STATEMENTS	S6201070
EQUIVALENCE	S6201080
. (PLUS,RANGE),(PLUS(181),BEARNG),(PLUS(361),SIGYBR)	S6201090
. ,(PLUS(541),XCORSG),(PLUS(547),CORSG),(PLUS(727),RBORSG)	S6201100
C	S6201110
CF OUTPUT FORMAT STATEMENTS	S6201120
CF	S6201130
9001 FORMAT(I4,2A2,I3,1X,A2,A1,1X,I4)	S6201140
9002 FORMAT(A1,2H -,G10.4)	S6201150
C	S6201160
C TYPE AND DIMENSION STATEMENTS	S6201170
C	S6201180
C** VARIABLE NAME "PLUS" WAS CHANGED NOV 9, 1979 BECAUSE OF CONFLICT	S6201190
C** WITH THE LABELED COMMON DEVICE EMPLOYED...J.S.H.	S6201200
C	S6201210
LOGICAL DFALTC,FLGEND,FLGDAT,FLGLTR,TTY,FLGOUT,FLGSPC(4),TWOLAY	S6201220
. ,FLGPH	S6201230
INTEGER PEN,UNITS(7,7),PDO,DFLT,WNITS(6,7),AT(2),ADD(2),LETR2(2)	S6201240
. ,LALPHA(2),BKARO,BLANK1,BKAKO,YORNO(18),CDT(57),SMORLW(14)	S6201250
. ,CR,CRLF,CURSUP,BLANK,RS,PSORL(9,4)	S6201260
DIMENSION PLETH(10),LPAREN(2),JSPECI(3,4),LSPECI(11,4)	S6201270
. ,IALPHA(80),KSPECI(3,4),IP(5),L1(3)	S6201280
. ,DISOF(5),LPLNTQ(1),JCDT(12,6)	S6201290
. ,KCDT(13,6),DPLETH(5),KSPL(4),KCDTN(6)	S6201300
. ,JUNITS(6,4),JLABS(6,4),JDATA(6,4),LETRO(2)	S6201310
. ,IBREAK(5),IFISOS(10),NOISOS(13),IBUF(4)	S6201320
EQUIVALENCE (LETR2(2),LETR),(LALPHA(2),IALPHA),(LALPHA,LALPH1)	S6201330
. ,(L1(2),L3)	S6201340
. ,(IALPHA(1),IFRMT(1))	S6201350
C	S6201360
C JUNITS(CHOICE,SPECIES)	S6201370
C	S6201380
C	S6201390
DATA JUNITS	S6201400
. /1,3,1,5,0,0	S6201410
. ,1,3,1,0,0,0	S6201420
. ,1,3,1,0,0,0	S6201430
. ,2,4,2,6,6,7/	S6201440
DATA NOISOS/23,1H-,2HOU,2HTS,2HID,1HE,2HPL,2HOT,2H B,2HOU,2HND,	S6201450
. 2HAR,1HY/	S6201460
C	S6201470
C JLABS(CHOICE,SPECIES)	S6201480
C	S6201490
DATA JLABS	S6201500
. /1,2,3,4,0,0	S6201510
. ,1,2,3,0,0,0	S6201520
. ,1,2,3,0,0,0	S6201530
. ,1,2,3,5,6,6/	

C			S6201540
C	JDATA(CHOICE,SPECIES)		S6201550
C			S6201560
	DATA JDATA		S6201570
	. /1,2,3,1,0,0		S6201580
	. ,1,2,3,0,0,0		S6201590
	. ,1,2,3,0,0,0		S6201600
	. ,4,5,6,4,4,1/		S6201610
C			S6201620
C	UNITS		S6201630
C			S6201640
	DATA UNITS		S6201650
	. /3*OB,2H p,2Hpm,2*OB		S6201660
	. ,3*OB,2H m,2Hg/,46416B,31417B		S6201670
	. ,OB,2H p,2Hpm,2H-s,2Hec,2*OB		S6201680
	. ,OB,2H m,2Hg-,2Hse,2Hc/,46416B,31417B		S6201690
	. ,3*OB,4OB,2HpH,2*OB		S6201700
	. ,2*OB,2H m,2Hg/,46416B,31017B,OB		S6201710
	. ,4OB,2HPA,2HRT,2H./,46416B,31017B,OB/		S6201720
	DATA WNITS		S6201730
	. /2H P,2HPM,4*2H		S6201740
	. ,2H M,2HG/,2HM*,2H*3,2*2H		S6201750
	. ,2H P,2HPM,2H-S,2HEC,2*2H		S6201760
	. ,2H M,2HG-,2HSE,2HC/,2HM*,2H*3		S6201770
	. ,2H P,2HH ,4*2H		S6201780
	. ,2H M,2HG/,2HM*,2H*2,2*2H		S6201790
	. ,2H P,2HAR,2HT.,2H/M,2H**,2H2 /		S6201800
	DATA MTH/2H T,2HHI,2HRD,2H		S6201810
	. ,2H F,2HOU,2HRT,2HH		S6201820
	. ,2H F,2HIF,2HTH,2H		S6201830
	. ,2H S,2HIX,2HTH,2H		S6201840
	. ,2HSE,2HVE,2HNT,2HH		S6201850
	. ,2H E,2HIG,2HHT,2HH		S6201860
	. ,2H N,2HIN,2HTH,2H		S6201870
	. ,2H ,2HLA,2HST,2H /		S6201880
	DATA NFSLS/2HSE,2HCO,2HND,		S6201890
	* 2HTH,2HIR,1HD,		S6201900
	* 2HFO,2HUR,2HTH,		S6201910
	* 2HFI,2HFT,1HH,		S6201920
	* 2HSI,2HXT,1HH,		S6201930
	* 2HSE,2HVE,2HNT,		S6201940
	* 2HEI,2HGH,2HTH,		S6201950
	* 2HNI,2HNT,1HH,		S6201960
	* 2HTE,2HNT,1HH/		S6201970
C			S6201980
C	VARIABLES		S6201990
C			S6202000
	DATA JCDDT		S6202010
	. /5*2H	,2H C,2HON,2HCE,2HNT,2HRA,2HTI,2HON	S6202020
	. ,9*2H	,2HDO,2HSA,2HGE	S6202030
	. ,2H T,2HIM,2HE ,2HME,2HAN,2H C,2HON,2HCE,2HNT,2HRA,2HTI,2HON		S6202040
	. ,8*2H	,2H A,2HCI,2HDI,2HTY	S6202050

. ,3*2H	,2HWA,2HSH,2HOU,2HT ,2HDE,2HPO,2HSI,2HTI,2HON	S6202060
. ,2HGR,2HAV,2HIT,2HAT,2HIO,2HNA,2HL	,2HDE,2HPO,2HSI,2HTI,2HON/	S6202070
DATA KCDT		S6202080
. /2H C,2HON,2HCE,2HNT,2HRA,2HTI,2HON,40B,5*0B		S6202090
. ,2H D,2HOS,2HAG,2HE ,9*0B		S6202100
. ,2H T,2HIM,2HE ,2HME,2HAN,2H C,2HON,2HCE,2HNT,2HRA,2HTI,2HON,40B		S6202110
. ,2H A,2HCI,2HDI,2HTY,40B,8*0B		S6202120
. ,2H W,2HAS,2HHO,2HUT,2H D,2HEP,2HOS,2HIT,2HIO,2HN ,3*0B		S6202130
. ,2H G,2HRA,2HVI,2HTA,2HTI,2HON,2HAL,2H D,2HEP,2HOS,2HIT,2HIO		S6202140
. ,2HN /		S6202150
DATA CDT		S6202160
. /40B,15446B,62104B,103B,15446B,62100B,2HON,2HCE,2HNT,2HRA,2HTI		S6202170
. ,2HON,5*0B,15446B,62100B		S6202180
. ,40B,15446B,62104B,104B,15446B,62100B,2HOS,2HAG,105B,8*0B,15446B		S6202190
. ,62100B		S6202200
. ,40B,15446B,62104B,124B,15446B,62100B,2HIM,2HE ,2HME,2HAN,2H C		S6202210
. ,2HON,2HCE,2HNT,2HRA,2HTI,2HON,15446B,62100B/		S6202220
		S6202230
		S6202240
		S6202250
		S6202260
		S6202270
		S6202280
		S6202290
		S6202300
		S6202310
		S6202320
		S6202330
		S6202340
		S6202350
		S6202360
		S6202370
		S6202380
		S6202390
		S6202400
		S6202410
		S6202420
		S6202430
		S6202440
		S6202450
		S6202460
		S6202470
		S6202480
		S6202490
		S6202500
		S6202510
		S6202520
		S6202530
		S6202540
		S6202550
		S6202560
		S6202570

C
C
C

SPECIES

DATA JSPECI

. /2H ,2H H,2HCl
. ,2H ,2H C,2HO2
. ,2H ,2H ,2HCO
. ,2H A,2H12,2HO3/

DATA LSPECI

. /15446B,62104B,110B,15446B,62100B,2HCl,15446B,62100B,0B,15446B
. ,62100B
. ,15446B,62104B,103B,15446B,62100B,117B,15446B,62104B,62B,15446B
. ,62100B
. ,15446B,62104B,103B,15446B,62100B,117B,15446B,62100B,0B,15446B
. ,62100B
. ,15446B,62104B,101B,15446B,62100B,2H12,15446B,62100B,2HO3,15446B
. ,62100B/

DATA KSPECI

. /2H H,2HCL,40B
. ,2H C,2HO2,40B
. ,2H C,2HO ,0B
. ,2H A,2HL2,2HO3/

DATA KSPL/4,4,3,6/,FLGSPC/4*.FALSE./,FLGPH/.FALSE./

. ,KCDTN/14,7,24,8,19,25/

DATA CR,CRLF,BLANK,BLANK1,BKARO,BKAKO,ZIP

. /15B,6412B,20040B,40B,20137B,137B,5*0/

DATA AT,ADD,LETR2(1),LPAREN,BKARO/1,1H@,1,1H+,1,2H(,2H),2H _/

. ,LETRO/1,1HO/

DATA DISOF/0.1,0.3,0.5,0.7,0.9/

DATA SMORLW/2H L,2HOW,2HER

. ,2H ,2H S,2HUM
. ,2H L,2HAY,2HER,2H 1
. ,2H L,2HAY,2HER,2H 2/

DATA PSORL/16,2HLO,2HWE,2HR ,2HLA,2HYE,2HR ,2HON,2HLY

. ,13,2HSU,2HM ,2HOF,2H L,2HAY,2HER,2HS ,2H

.	,12,2HLA,2HYE,2HR ,2H1 ,2HON,2HLY,2H ,2H	S6202580
.	,12,2HLA,2HYE,2HR ,2H2 ,2HON,2HLY,2H ,2H /	S6202590
	DATA XSCALE,YSCALE,D2RAD/0.2631,0.3545,0.01745329/	S6202600
	DATA YORNO/15446B,62106B,131B,15446B,62102B,2HES,15446B,62100B	S6202610
.	,2H 0,2HR ,15446B,62104B,116B,15446B,62100B,117B,15446B,62100B/	S6202620
	DATA ICONMA/26000B/	S6202630
	DATA IIHL1,IH1,IIHL2,IH2,IIHLA,IIHR1,IIHR2/2HL1,1H1,2HL2,1H2,2HLA,	S6202640
.	2HR1,2HR2/	S6202650
.	,IIHSU/2HSU/,IHC,IHD,IHT,IHM,IHP,IHL,IHAT,IHV/1HC,1HD,1HT,1HM,	S6202660
.	1HP,1HL,1H@,1HV/,IHS/1HS/	S6202670
C		S6202680
C	STATEMENT FUNCTIONS	S6202690
C		S6202700
	XRF(I)=(RISTIM(I)-RISBOT)*SPEEDN(I)*COS((360.0-DIRN(I))*D2RAD)	S6202710
	YRF(I)=(RISTIM(I)-RISBOT)*SPEEDN(I)*SIN((360.0-DIRN(I))*D2RAD)	S6202720
	XRP(R,B)=R*COS((180.0-B)*D2RAD)	S6202730
	YRP(R,B)=R*SIN((180.0-B)*D2RAD)	S6202740
C		S6202750
C****	FIRST EXECUTABLE STATEMENT.	S6202760
C		S6202770
	TTY=.NOT.CRT	S6202780
	IF(CRT) GO TO 50	S6202790
	K=0	S6202800
	DO 40 I=1,6	S6202810
	IF(I.GT.4) GO TO 30	S6202820
	DO 20 J=1,4	S6202830
	LSPECI(3*I-2,J) = NULL	S6202840
	LSPECI(3*I-1,J) = NULL	S6202850
	IF(J.GT.3) GO TO 20	S6202860
	IF(I.GT.2) GO TO 10	S6202870
	CDT(3*I-1+19*(J-1)) = NULL	S6202880
	CDT(3*I+19*(J-1)) = NULL	S6202890
	GO TO 20	S6202900
10	CDT(18+19*(J-1)) = NULL	S6202910
	CDT(19+19*(J-1)) = NULL	S6202920
20	CONTINUE	S6202930
	IF(I.EQ.4) K=1	S6202940
30	YORNO(3*I+K-2) = NULL	S6202950
	YORNO(3*I+K-1) = NULL	S6202960
40	CONTINUE	S6202970
50	ASSIGN 80 TO IGO	S6202980
	FIRSTP=.FALSE.	S6202990
	FIRSTV=-1	S6203000
C		S6203010
C	SET TABS AND DEFINE ALTERNATE CHARACTER SET.	S6203020
C	TABS SET IN COLS: 7,20,30,49,64	S6203030
C		S6203040
	IF(CRT) WRITE(ICU,9003) CR,CLRDSP,(SETTAB,I=1,5),ALTSET,CR,BKAKO	S6203050
9003	FORMAT(2A2,6X,A2,13X,A2,10X,A2,19X,A2,15X,5A2)	S6203060
	IPLTHP=0	S6203070
60	IVARP = 0	S6203080
C		S6203090

C	DETERMINE THE ORIGIN ON THE MAP FOR THIS PLOT AND MOVE THE	S6203100
C	PEN THERE	S6203110
C		S6203120
	70 CONTINUE	S6203130
	GO TO IGO	S6203140
		S6203150
C		S6203160
C	SELECT VARIABLES AND POLLUTANTS TO BE PLOTTED.	S6203170
C		S6203180
	80 FIRSTP=.FALSE.	S6203190
	IF(MODEL.GT.4) GO TO 220	S6203200
		S6203210
C	MODEL 4 ONLY.	S6203220
C		S6203230
	LDO=1	S6203240
	DO 90 J=0,2	S6203250
	J19=19*J	S6203260
	DO 90 I=1,19	S6203270
	IALPHA(I+J19)=CDT(I+J19)	S6203280
	90 CONTINUE	S6203290
		S6203300
C	INVERSE VIDEO INDICATES THE DEFAULT	S6203310
C		S6203320
	IALPHA(3+19*IPLTHP)=IOR(IALPHA(3+19*IPLTHP),2B)	S6203330
	IALPHA(6+19*IPLTHP)=IOR(IALPHA(6+19*IPLTHP),2B)	S6203340
	100 IF (CRT) GO TO 140	S6203350
	IF (IPLTHP .EQ. 2) GO TO 120	S6203360
	IF (IPLTHP .EQ. 1) GO TO 110	S6203370
	J1 = 4	S6203380
	J2 = 17	S6203390
	J3 = 23	S6203400
	J4 = 36	S6203410
	J5 = 42	S6203420
	J6 = 55	S6203430
	GO TO 130	S6203440
	110 J1 = 23	S6203450
	J2 = 36	S6203460
	J3 = 4	S6203470
	J4 = 17	S6203480
	J5 = 42	S6203490
	J6 = 55	S6203500
	GO TO 130	S6203510
	120 J1 = 42	S6203520
	J2 = 55	S6203530
	J3 = 4	S6203540
	J4 = 17	S6203550
	J5 = 23	S6203560
	J6 = 36	S6203570
	130 CONTINUE	S6203580
	WRITE(ICU,9005) LPAREN(1),(IALPHA(I),I=J1,J2),ICOMMA	S6203590
	.,(IALPHA(I),I=J3,J4),ICOMMA	S6203600
	.,(IALPHA(I),I=J5,J6),LPAREN(2),BKARO	S6203610
	GO TO 150	

140	CONTINUE	S6203620
	WRITE(ICU,9004) LPAREN(1),(IALPHA(I),I=1,19),TAB2	S6203630
	. , (IALPHA(I),I=20,38),TAB2,(IALPHA(I),I=39,57)	S6203640
	. ,LPAREN(2),BKARO	S6203650
150	CONTINUE	S6203660
9004	FORMAT(19H PLOT ISOPLETHS OF: ,20A2/A2,2X,19A2/A2,2X,21A2)	S6203670
9005	FORMAT(19H PLOT ISOPLETHS OF: ,47A2)	S6203680
	L1=40B	S6203690
160	CALL EXEC(1,ICU+400B,L1,-1)	S6203700
C		S6203710
C		S6203720
	IF(CRT) WRITE(ICU,9009) (CURSUP,K=1,3),DELINE,CLRDSP,BKAKO	S6203730
	IF(L1.NE.IBLNK) GO TO 170	S6203740
C		S6203750
C	DEFAULT	S6203760
C		S6203770
	JDO=IPLTHP+1	S6203780
	GO TO 200	S6203790
170	IF(L1.NE.IHC) GO TO 180	S6203800
C		S6203810
C	CONCENTRATION SELECTED	S6203820
C		S6203830
	JDO=1	S6203840
	GO TO 200	S6203850
180	IF(L1.NE.IHD) GO TO 190	S6203860
C		S6203870
C	DOSAGE SELECTED	S6203880
C		S6203890
	JDO=2	S6203900
	GO TO 200	S6203910
190	IF(L1.NE.IHT) GO TO 100	S6203920
C		S6203930
C	TIME MEAN CONCENTRATION	S6203940
C		S6203950
	JDO=3	S6203960
200	IPLTHP=MOD(JDO,3)	S6203970
	FIRSTP=.FALSE.	S6203980
	JLAB=JLABS(JDO,1)	S6203990
210	WRITE(ICU,9006) (JCDT(I,JLAB),I=1,12)	S6204000
9006	FORMAT(20H PLOT ISOPLETHS OF: ,21X,12A2)	S6204010
220	IF(MODEL.GT.5) GO TO 410	S6204020
C		S6204030
C	MODELS 4 AND 5	S6204040
C		S6204050
	IF(FIRSTP.AND.IVARP.EQ.FIRSTV) GO TO 80	S6204060
C		S6204070
C	FORM PROMPT MESSAGE (ALSO COUNT*NUMBER OF SPECIES PRESENT)	S6204080
C		S6204090
	NSPECI=0	S6204100
	NWDS=0	S6204110
	DO 240 J=1,4	S6204120
	IF(IPLINT(J).LE.0) GO TO 250	S6204130

C		S6204140
C	NO DEPOSITION OR WASHOUT OF CO OR CO2	S6204150
C		S6204160
	IF(MODEL.GT.4.AND.(IPLLNT(J).EQ.2.OR.IPLLNT(J).EQ.3)) GO TO 240	S6204170
	JM1=J-1	S6204180
	NWDS=NWDS+12	S6204190
	NSPECI=NSPECI+1	S6204200
	FLGSPC(IPLLNT(J))=.TRUE.	S6204210
	DO 230 I=1,11	S6204220
	IALPHA(I+12*JM1)=LSPECI(I,IPLLNT(J))	S6204230
230	CONTINUE	S6204240
	IALPHA(12*J)=ICOMMA	S6204250
240	CONTINUE	S6204260
250	NWDS=NWDS-1	S6204270
C		S6204280
C	DON'T DISPLAY PROMPT IF THERE ARE NO CHOICES	S6204290
C		S6204300
	IF(NSPECI.EQ.1) GO TO 280	S6204310
C		S6204320
C	INVERSE VIDEO FOR DEFAULT	S6204330
C		S6204340
	DO 260 J=2,8,3	S6204350
	IALPHA(J+12*IVARP)=IOR(IALPHA(J+12*IVARP),2B)	S6204360
260	CONTINUE	S6204370
270	WRITE(ICU,9007) CR,LPAREN(1),(IALPHA(I),I=1,NWDS),LPAREN(2),BKARO	S6204380
9007	FORMAT(A2,22H PLOT ISOPLETHS FOR: ,60A2)	S6204390
	L1 = NULL	S6204400
	L2 = NULL	S6204410
	L3 = NULL	S6204420
	CALL EXEC(1,ICU+400B,L1,3)	S6204430
	IF (L1 .EQ. MINUS1.AND.MODEL .LE. 4) GO TO 80	S6204440
9008	FORMAT(5A1)	S6204450
	L2=IAND(377B,L1)	S6204460
	L1=IAND(177400B,L1)	S6204470
		S6204480
C		S6204490
C	ERASE PROMPT	S6204500
C		S6204510
	IF(CRT) WRITE(ICU,9009) CURSUP,DELINE,BKAKO	S6204520
9009	FORMAT(50A2)	S6204530
	IF(L1.NE.20000B) GO TO 290	S6204540
C		S6204550
C	DEFAULT	S6204560
C		S6204570
	280 IDO=IPLLNT(IVARP+1)	S6204580
	GO TO 390	S6204590
	290 IF(L1.NE.44000B.OR..NOT.FLGSPC(1)) GO TO 300	S6204600
C		S6204610
C	HCL SELECTED	S6204620
C		S6204630
	IDO=1	S6204640
	GO TO 380	S6204650
	300 IF(L1.NE.40400B.OR..NOT.FLGSPC(4)) GO TO 310	

C		S6204660
C	AL203 SELECTED	S6204670
C		S6204680
	IDO=4	S6204690
	GO TO 380	S6204700
	310 IF(L1.EQ.41400B.AND.(FLGSPC(2).OR.FLGSPC(3))) GO TO 330	S6204710
C		S6204720
C	BAD ENTRY PROCESSING	S6204730
C		S6204740
	320 WRITE (ICU,9010) INV,OFF,22,2	S6204750
	9010 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S6204760
	*,I2,IH.,I2//)	S6204770
	GO TO 270	S6204780
C		S6204790
C	CO2 AND CO	S6204800
C		S6204810
	330 IF(L2.NE.62B.OR..NOT.FLGSPC(2)) GO TO 350	S6204820
C		S6204830
C	CO2 SELECTED	S6204840
C		S6204850
	340 IDO=2	S6204860
	GO TO 380	S6204870
	350 IF(L2.NE.40B.OR..NOT.FLGSPC(3)) GO TO 370	S6204880
C		S6204890
C	CO SELECTED	S6204900
C		S6204910
	360 IDO=3	S6204920
	GO TO 380	S6204930
	370 IF(L2.NE.117B) GO TO 320	S6204940
	IF(L3.EQ.IBLNK.AND.FLGSPC(3)) GO TO 360	S6204950
	IF(L3.EQ.IH2.AND.FLGSPC(2)) GO TO 340	S6204960
	GO TO 320	S6204970
C		S6204980
C	PICK UP CONVERSION FACTOR AND WRITE SPECIES SELECTED	S6204990
C		S6205000
	380 FIRSTP=.FALSE.	S6205010
C		S6205020
C	SET UP NEXT DEFAULT	S6205030
C		S6205040
	390 DO 400 I=1,4	S6205050
	IF(IDO.NE.IPLLNT(I)) GO TO 400	S6205060
	IVARP=MOD(I,NSPECI)	S6205070
	IF(FIRSTP) GO TO 410	S6205080
	FIRSTP=.TRUE.	S6205090
	FIRSTV=MOD(I+NSPECI-1,NSPECI)	S6205100
	GO TO 410	S6205110
	400 CONTINUE	S6205120
	IVARP=0	S6205130
	FIRSTP=.FALSE.	S6205140
	FIRSTV=-1	S6205150
	410 LNDX=0	S6205160
	IF(MODEL.EQ.6) IDO=4	S6205170

WRITE(ICU,9007) CR,(BLANK,I=1,18),BLANK1,(JSPECI(I,IDO),I=1,3)	S6205180
IF(MODEL.LT.5) GO TO 540	S6205190
IF(MODEL.GT.5) GO TO 500	S6205200
C	S6205210
C MODEL 5 ONLY	S6205220
C	S6205230
JDO=4	S6205240
C	S6205250
C	S6205260
420 WRITE(ICU,9011) INVNDR,INV,OFF,(ULINE,OFF,I=1,4)	S6205270
9011 FORMAT(20H PLOT ISOPLETHS FOR ,2A2,1HS,2A2,2HUM,2A2,14H OF LAYERS	S6205280
*OR ,2A2,1HL,2A2,5HAYER ,2A2,1H1,2A2,4H OR ,2A2,1HL,2A2,5HAYER ,2A2	S6205290
*,1H2,2A2,4H? :_)	S6205300
LDO=1	S6205310
KS = 4	S6205320
K = 4	S6205330
J = 6	S6205340
LNDX = 2	S6205350
DO 430 I=1,4	S6205360
430 IBUF(I) = IBLNK	S6205370
READ (ICU,9009) IBUF	S6205380
IF (IBUF(1) .EQ. MINUS1) GO TO 80	S6205390
IF (IBUF(1) .NE. MINUS9) GO TO 440	S6205400
IERROR(1) = 1	S6205410
NNNEST = 1	S6205420
GO TO 1280	S6205430
440 IF (IBUF(1).EQ.IBLNK.OR.IBUF(1).EQ.IHS.OR.IBUF(1).EQ.IIHSU) GO TO	S6205440
*490	S6205450
IF (IBUF(1).EQ.IIHL1.OR.IBUF(1).EQ.IH1) GO TO 460	S6205460
IF (IBUF(1).EQ.IIHL2.OR.IBUF(1).EQ.IH2) GO TO 470	S6205470
IF (IBUF(1).NE.IIHLA.OR.IBUF(2).NE.IYESJ) GO TO 450	S6205480
IF (IBUF(3).EQ.IIHR1.OR.IBUF(4).EQ.IH1) GO TO 460	S6205490
IF (IBUF(3).EQ.IIHR2.OR.IBUF(4).EQ.IH2) GO TO 470	S6205500
450 WRITE (ICU,9010) INV,OFF,22,3	S6205510
GO TO 420	S6205520
460 KS = 6	S6205530
K = 7	S6205540
J = 10	S6205550
LNDX = 0	S6205560
GO TO 490	S6205570
470 IF (LAYTOP(2) .GT. 0) GO TO 480	S6205580
IF (CRT) WRITE (ICU,9009) CURSUP,DELINE,BKAKO	S6205590
WRITE (ICU,9012)	S6205600
9012 FORMAT (29H THERE IS NOT A SECOND LAYER)	S6205610
GO TO 420	S6205620
480 KS = 8	S6205630
K = 11	S6205640
J = 14	S6205650
LNDX = 1	S6205660
490 CONTINUE	S6205670
IF (CRT) WRITE (ICU,9009) CURSUP,DELINE,BKAKO	S6205680
WRITE (ICU,9015) TAB2,(SMORLW(I),I=K,J)	S6205690

	FLGPH=.TRUE.	S6205700
	IF(IDO.EQ.4) FLGPH=.FALSE.	S6205710
	GO TO 540	S6205720
C		S6205730
C	MODEL 6 ONLY.	S6205740
C		S6205750
	500 IDO=4	S6205760
	JDO=5	S6205770
	LNDX=0	S6205780
	LDO=1	S6205790
	WRITE(ICU,9013) INVNDR,INV,OFF,ULINE,OFF,BKARO	S6205800
	9013 FORMAT(21H PLOT DEPOSITION IN (,2A2,1HM,2A2,9HILLIGRAMS,2A2,4H OR	S6205810
	.,2A2,1HP,2A2,14HARTICLES/M**3),A2)	S6205820
	K = 40B	S6205830
	CALL EXEC(1,ICU+400B,K,-1)	S6205840
	IF(CRT) WRITE(ICU,9009) CURSUP,DELIN, BKAKO	S6205850
	IF(K.EQ.IBLNK.OR.K.EQ.IHM) GO TO 520	S6205860
	IF(K.EQ.IHP) GO TO 510	S6205870
	WRITE (ICU,9010) INV,OFF,22,4	S6205880
	GO TO 500	S6205890
	510 JDO=6	S6205900
	520 WRITE(ICU,9014) INVNDR,INV,OFF,ULINE,OFF,BKARO	S6205910
	9014 FORMAT(20H PLOT ISOPLETHS FOR ,2A2,1HS,2A2,2HUM,2A2,	S6205920
	.18H OF LAYERS OR FOR ,2A2,1HL,2A2,16HOWER LAYER ONLY?,A2)	S6205930
	K=40B	S6205940
	CALL EXEC(1,ICU+400B,K,-1)	S6205950
	IF(CRT) WRITE(ICU,9009) CURSUP,DELIN, BKAKO	S6205960
	IF(K.EQ.IHL.OR. K.EQ.IHS.OR. K.EQ.IBLNK) GO TO 530	S6205970
	WRITE (ICU,9010) INV,OFF,22,5	S6205980
	GO TO 520	S6205990
	530 KS=4	S6206000
	IF(K.EQ.IHL) KS=1	S6206010
	WRITE(ICU,9015) TAB2,(SMORLW(I),I=KS,KS+2)	S6206020
	9015 FORMAT(21H ISOPLETHS DRAWN FOR:,A2,11X,4A2)	S6206030
	IF(K.NE.IHL) GO TO 540	S6206040
	LNDX=1	S6206050
C		S6206060
C	SELECT UNITS FOR DISPLAY AND DATA LOCATION	S6206070
C		S6206080
	540 JUNIT=JUNITS(JDO,IDO)	S6206090
	JLAB=JLABS(JDO,IDO)	S6206100
	LNDX=LNDX+JDATA(JDO,IDO)	S6206110
C		S6206120
C	RESET YORNO DEFAULT BACK TO Y	S6206130
C		S6206140
	550 IF(TTY) GO TO 560	S6206150
	YORNO(2)=62106B	S6206160
	YORNO(5)=62102B	S6206170
	YORNO(12)=62104B	S6206180
	YORNO(15)=62100B	S6206190
C		S6206200
C	COMPUTE AND DISPLAY MAXIMUM	S6206210

C		S6206220
560	QF=QCONV(IDO)	S6206230
	QMAX=QF*XCORSG(LNDX)	S6206240
	CQMAX=QMAX	S6206250
	IF(FLGPH) CQMAX=XCORSG(LNDX)	S6206260
	WRITE(ICU,9016) (KCDT(I,JLAB),I=1,13),(KSPECI(I,IDO),I=1,3),QMAX	S6206270
	, (UNITS(N1,JUNIT),N1=1,7)	S6206280
9016	FORMAT(8H MAXIMUM,13A2,2HOF,3A2,1H=,G10.4,7A2)	S6206290
C		S6206300
C	COMPUTE DEFAULT ISOPLETH VALUES	S6206310
C		S6206320
	NPLETH=0	S6206330
	DO 580 N1=1,5	S6206340
	PLETH(N1+N1-1)=0.0	S6206350
	PLETH(N1+N1)=0.0	S6206360
	DPLETH(N1)=DISOF(N1)*QMAX	S6206370
C		S6206380
C	DEFAULT ISOPLETHS OF pH.	S6206390
C		S6206400
	IF(.NOT.FLGPH) GO TO 570	S6206410
	IF(FLOAT(6-N1).LT.XCORSG(LNDX)) GO TO 580	S6206420
	DPLETH(NPLETH+1)=FLOAT(6-N1)	S6206430
570	NPLETH=NPLETH+1	S6206440
580	CONTINUE	S6206450
C		S6206460
C	DISPLAY DEFAULT ISOPLETHS	S6206470
C		S6206480
	590 WRITE(ICU,9017) (TAB2,INVHF,DPLETH(N1)	S6206490
	, (UNITS(N2,JUNIT),N2=1,7),OFF,N1=1,NPLETH)	S6206500
9017	FORMAT(23H DEFAULT ISOPLETHS ARE:,3A2,G11.4,9A2/	S6206510
	,4(21X,3A2,G11.4,9A2/))	S6206520
600	J = 0	S6206530
610	J = J+1	S6206540
	IF (J .GT. 10) GO TO 720	S6206550
620	IF (J .GT. 1) GO TO 640	S6206560
630	WRITE (ICU,9018) CURSUP,CLRLNE,INV,OFF,INV,OFF	S6206570
9018	FORMAT (2A2,7H ENTER ,2A2,5HFIRST,2A2,17H ISOPLETH VALUE (,2A2,	S6206580
	*14HSPACE - RETURN,2A2,14H FOR DEFAULTS))	S6206590
	GO TO 650	S6206600
640	N1 = IBLNK	S6206610
	IF (J .EQ. 7) N1 = NFSLS(3,5)	S6206620
	WRITE (ICU,9019) CURSUP,CLRLNE,CURSUF,CLRLNE,INV,(NFSLS(N2,J-1),	S6206630
	*N2=1,3),N1,OFF,INV,OFF	S6206640
9019	FORMAT (4A2,7H ENTER ,5A2,A1,2A2,17H ISOPLETH VALUE (,2A2,	S6206650
	*14HSPACE - RETURN,2A2,28HTO TERMINATE ISOPLETH INPUT))	S6206660
650	CALL IFNBR(LALPH1,20,IER,ICU)	S6206670
	IF (IER .EQ. 0) GO TO 660	S6206680
	WRITE (ICU,9010) INV,OFF,22,6	S6206690
	GO TO 620	S6206700
660	IF (LALPH1 .EQ. IBLNK) GO TO 700	S6206710
	IF (LALPH1 .NE. MINUS1) GO TO 670	S6206720
	IF (J .EQ. 1) GO TO 80	S6206730

J = J-1		
GO TO 620		S6206740
670 CALL CODE(80)		S6206750
READ (LALPH1,*) PLETH(J)		S6206760
IF (FLGPH) GO TO 680		S6206770
IF (PLETH(J) .GT. CQMAX.OR.PLETH(J) .LE. 0.0) GO TO 690		S6206780
GO TO 610		S6206790
680 IF (PLETH(J) .GE. CQMAX.AND.PLETH(J) .LE. 14) GO TO 610		S6206800
690 WRITE (ICU,9020) INV,OFF		S6206810
9020 FORMAT (2A2,31H ISOPLETH VALUE IS OUT OF RANGE,2A2//)		S6206820
GO TO 620		S6206830
700 IF (J .GT. 1) GO TO 720		S6206840
C USE DEFAULT VALUES		S6206850
DO 710 J=1,NPLETH		S6206860
710 PLETH(J) = DPLETH(J)		S6206870
GO TO 730		S6206880
720 NPLETH = J-1		S6206890
730 WRITE (ICU,9021) (TAB2,PLETH(N1),(UNITS(N2,JUNIT),N2=1,7),N1=1,		S6206900
*NPLETH)		S6206910
9021 FORMAT (23H ISOPLETHS PLOTTED ARE:,A2,G11.4,7A2/4(21X,A2,G11.4,7A2		S6206920
*/))		S6206930
C		S6206940
C LET'S PLOT		S6206950
C		S6206960
740 CONTINUE		S6206970
DIRNL = AIMAG(RBORSG(LNDX))+180.0		S6206980
CALL ORGIN(IX0,IY0,DIRNL)		S6206990
WRITE(ICU,9022) CR,CLRDSP,BLNKNG,OFF,BKAKO		S6207000
9022 FORMAT(2A2,10X,2A2,8HPLOTTING,2A2)		S6207010
CALL PLTLU(IPU3)		S6207020
CALL SFACT(99.99,99.99)		S6207030
CALL LLEFT		S6207040
ITVXX=0		S6207050
ITVXN=9999		S6207060
CALL SYMB(0.01*FLOAT(IX0-45),0.01*FLOAT(IY0-80),1.6,LETRO,0.0,1)		S6207070
C		S6207080
C DETERMINE THE INDEX OF THE LAYER THAT HAS		S6207090
C THAT ALTITUDE JUST LOWER THAN THE EFFECTIVE CLOUD HEIGHT, H		S6207100
C		S6207110
DO 750 I=2,NUM		S6207120
IF(H .GT. ALT(I))GO TO 750		S6207130
IH = I - 2		S6207140
GO TO 760		S6207150
750 CONTINUE		S6207160
IH = MAX0(LAYTOP(1),LAYTOP(2))		S6207170
C		S6207180
C CALCULATE THE CLOUD MOVEMENT ALONG THE GROUND		S6207190
C AS FAR AS THE CLOUD STABILIZATION POINT		S6207200
C		S6207210
760 X = 0.0		S6207220
Y = 0.0		S6207230
CALL PLOT(0.01*FLOAT(IX0),0.01*FLOAT(IY0),3)		S6207240
		S6207250

RISBOT=0.0	S6207260
DO 770 I=1,IH	S6207270
X=X+XRF(I)	S6207280
Y=Y+YRF(I)	S6207290
RISBOT=RISTIM(I)	S6207300
IX = INT(0.2631 * X) + IX0	S6207310
IY = INT(0.3545 * Y) + IY0	S6207320
770 CONTINUE	S6207330
780 IHP1=IH+1	S6207340
X=X+SPEEDN(IHP1)*(TAUK-RISTIM(IH))*COS((360.0-DIRN(IHP1))*D2RAD)	S6207350
Y=Y+SPEEDN(IHP1)*(TAUK-RISTIM(IH))*SIN((360.0-DIRN(IHP1))*D2RAD)	S6207360
IX=INT(XSCALE*X)+IX0	S6207370
IY=INT(YSCALE*Y)+IY0	S6207380
ISTABX=IX	S6207390
ISTABY=IY	S6207400
IF(IX.LT.75.OR.IX.GT.9925.OR.IY.LT.75.OR.IY.GT.9925) GO TO 790	S6207410
C	S6207420
C LABEL STABILIZATION POINT WITH A "+"	S6207430
C	S6207440
CALL SYMB(0.01*FLOAT(IX)-0.45,0.01*FLOAT(IY)-0.8,1.6,ADD,0.0,1)	S6207450
790 CONTINUE	S6207460
C	S6207470
C PLOT LINE OF MAXIMUM VALUES	S6207480
C	S6207490
NRNG = 1	S6207500
PEN=1	S6207510
800 IF(RANGE(NRNG,LNDX).LE.0.0.OR.SIGYBR(NRNG,LNDX).LE.0.0) GO TO 820	S6207520
XMAX=XRP(RANGE(NRNG,LNDX),BEARNG(NRNG,LNDX))	S6207530
YMAX=YRP(RANGE(NRNG,LNDX),BEARNG(NRNG,LNDX))	S6207540
IX=IFIX(XSCALE*XMAX)+IX0	S6207550
IY=IFIX(YSCALE*YMAX)+IY0	S6207560
IF(IX.LT.0.OR.IX.GT.9999.OR.IY.LT.0.OR.IY.GT.9999) GO TO 820	S6207570
810 CALL PLOT(0.01*FLOAT(IX),0.01*FLOAT(IY),PEN+2)	S6207580
PEN=1-PEN	S6207590
820 NRNG=NRNG+1	S6207600
IF(NRNG.LT.31) GO TO 800	S6207610
C	S6207620
C**** LABEL THE POINT OF MAXIMUM WITH AN "@".	S6207630
C	S6207640
830 XMAX=XRP(REAL(RBORSG(LNDX)),AIMAG(RBORSG(LNDX)))	S6207650
YMAX=YRP(REAL(RBORSG(LNDX)),AIMAG(RBORSG(LNDX)))	S6207660
IX=INT(XSCALE*XMAX)+IX0	S6207670
IY=INT(YSCALE*YMAX)+IY0	S6207680
IF(IX.GE.75.AND.IX.LE.9925.AND.IY.GE.75.AND.IY.LE.9925)	S6207690
. CALL SYMB(0.01*FLOAT(IX)-0.45,0.01*FLOAT(IY)-0.8,1.6,AT,0.0,1)	S6207700
PDO=1	S6207710
840 LETR=IHAT	S6207720
C	S6207730
C**** FIND IF THERE ARE ANY BREAKS IN ISOPLETHS	S6207740
DO 850 I=1,10	S6207750
IFISOS(I) = 0	S6207760
IF (I .GT. 5) GO TO 850	S6207770

	IBREAK(I) = 0	S6207780
850	CONTINUE	S6207790
	NBREAK = 0	S6207800
	NRNG = 0	S6207810
860	NRNG = NRNG+1	S6207820
	IF (NRNG .GT. 30) GO TO 910	S6207830
	IF (RANGE(NRNG,LNDX) .LE. 0.0) GO TO 860	S6207840
	XLST = XRP(RANGE(NRNG,LNDX),BEARNG(NRNG,LNDX))	S6207850
	YLST = YRP(RANGE(NRNG,LNDX),BEARNG(NRNG,LNDX))	S6207860
870	NRNG = 1	S6207870
880	IF (RANGE(NRNG,LNDX) .LE. 0.0) GO TO 900	S6207880
	XMAX = XRP(RANGE(NRNG,LNDX),BEARNG(NRNG,LNDX))	S6207890
	YMAX = YRP(RANGE(NRNG,LNDX),BEARNG(NRNG,LNDX))	S6207900
	XBREAK = SQRT((XMAX-XLST)**2+(YMAX-YLST)**2)	S6207910
	IF (XBREAK .LT. 2000.0) GO TO 890	S6207920
	NBREAK = NBREAK+1	S6207930
	IF (NBREAK.LE.5.AND.IBREAK(NBREAK).EQ.0) IBREAK(NBREAK)=NRNG	S6207940
890	XLST = XMAX	S6207950
	YLST = YMAX	S6207960
900	NRNG = NRNG+1	S6207970
	IF (NRNG .LT. 31) GO TO 880	S6207980
910	CONTINUE	S6207990
C		S6208000
C	PLOT THE NPLETH ISOPLETHS	S6208010
C		S6208020
	IF (NBREAK .NE. 0) WRITE (ICU,9023)	S6208030
9023	FORMAT (/60H WARNING - ISOPLETH PLOT IS BROKEN IN TWO, DUE TO WINDS	S6208040
	* SHEAR//)	S6208050
	DO 1150 N=1,NPLETH	S6208060
	NRNG=1	S6208070
	PEN=3	S6208080
	CPLETH=PLETH(N)	S6208090
C		S6208100
C	CONVERT pH TO CONCENTRATION.	S6208110
C		S6208120
	IF(FLGPH) CPLETH=10.0*(-CPLETH)	S6208130
	FLGOUT=.FALSE.	S6208140
	FLGEND=.FALSE.	S6208150
	FLGLTR=.FALSE.	S6208160
	FLGDAT=.FALSE.	S6208170
	LETR=LETR+400B	S6208180
920	IF(RANGE(IABS(NRNG),LNDX).LE.0.0.AND..NOT.FLGEND) GO TO 1140	S6208190
	IF(RANGE(IABS(NRNG),LNDX).LE.0.0.AND.FLGEND) GO TO 930	S6208200
	QFOC=QF/CPLETH	S6208210
	V=CORSG(IABS(NRNG),LNDX)	S6208220
	IF(FLGEND) GO TO 940	S6208230
	IF(NRNG.GT.0) GO TO 940	S6208240
	FLGEND=.TRUE.	S6208250
	NRNG=NRNG+1	S6208260
	IF(NRNG.GT.30) NRNG=-30	S6208270
	IF(FLGOUT) GO TO 920	S6208280
C		S6208290

C	LABEL DOWNWIND END OF CLOSED ISOPLETHS.	S6208300
C		S6208310
	ANG=(270.0-DIRNL)*D2RAD	S6208320
	FX=AMAX1(AMIN1(0.01*FLOAT(IX)+1.2*COS(ANG),98.9),0.1)	S6208330
	FY=AMAX1(AMIN1(0.01*FLOAT(IY)+1.2*COS(ANG),98.9),0.1)	S6208340
	CALL SYMB(FX,FY,1.0,LETR2,0.0,1)	S6208350
	CALL PLOT(0.01*FLOAT(IX),0.01*FLOAT(IY),3)	S6208360
	GO TO 920	S6208370
		S6208380
C		S6208390
C	LOCATION OF MAXIMUM AT DISTANCE=RANGE	S6208400
C		S6208410
	930 SIGYBR(IABS(NRNG),LNDX)=S0	S6208420
	V=0.0	S6208430
	BEARNG(IABS(NRNG),LNDX)=B0	S6208440
	RANGE(IABS(NRNG),LNDX)=R0-1000.0	S6208450
	NRNG=-1	S6208460
	GO TO 950	S6208470
	940 IF(FLGDAT) GO TO 950	S6208480
	V0=0.0	S6208490
	S0=SIGYBR(IABS(NRNG),LNDX)	S6208500
	B0=BEARNG(IABS(NRNG),LNDX)	S6208510
	R0=RANGE(IABS(NRNG),LNDX)-1000.0	S6208520
	FLGDAT=.TRUE.	S6208530
	950 DR=0.1*(RANGE(IABS(NRNG),LNDX)-R0)	S6208540
	DB=BEARNG(IABS(NRNG),LNDX)-B0	S6208550
	IF(DB.GT.180.0) DB=DB-360.0	S6208560
	IF(DB.LT.-180.0) DB=DB+360.0	S6208570
	DB=0.1*DB	S6208580
	DV=0.1*(V-V0)	S6208590
	DS=0.1*(SIGYBR(IABS(NRNG),LNDX)-S0)	S6208600
C		S6208610
C	INTERPOLATE BETWEEN RANGES	S6208620
C		S6208630
	NO PLOT = 0	S6208640
	IF (NBREAK .EQ. 0) GO TO 1000	S6208650
	IF (NRNG .GT. 0) GO TO 980	S6208660
	DO 960 I=1,NBREAK	S6208670
	IF (IABS(NRNG) .EQ. IBREAK(I)-1) GO TO 970	S6208680
	960 CONTINUE	S6208690
	GO TO 1000	S6208700
	970 NO PLOT = 1	S6208710
	GO TO 1000	S6208720
	980 DO 990 I=1,NBREAK	S6208730
	IF (NRNG .EQ. IBREAK(I)) GO TO 970	S6208740
	990 CONTINUE	S6208750
	1000 CONTINUE	S6208760
	NJPLOT = 0	S6208770
	NKPLOT = 0	S6208780
	DO 1100 IR=0,10	S6208790
	R=R0+DR*FLOAT(IR)	S6208800
	B=B0+DB*FLOAT(IR)	S6208810
	QFBOC=(V0+DV*FLOAT(IR))*QFOC	

	IF(QFBOC.LT.1.0) GO TO 1100	S6208820
	XMAX=XRP(R,B)	S6208830
	YMAX=YRP(R,B)	S6208840
C		S6208850
C	CALCULATE CROSSWIND DISTANCE TO ISOPLETH	S6208860
	NKPLOT = 0	S6208870
C		S6208880
	SIGYB=(S0+DS*FLOAT(IR))*SQRT(2.0*ALOG(QFBOC))	S6208890
	X=XMAX+XRP(SIGYB,DIRNL+FLOAT(ISIGN(90,NRNG)))	S6208900
	Y=YMAX+YRP(SIGYB,DIRNL+FLOAT(ISIGN(90,NRNG)))	S6208910
	IF (ABS(X-XMAX)-0.1) 1010,1010,1030	S6208920
1010	IF (ABS(Y-YMAX)-0.1) 1020,1020,1030	S6208930
1020	IF (NJPLOT .EQ. 0) NKPLOT = 1	S6208940
	NJPLOT = 0	S6208950
	GO TO 1040	S6208960
1030	IF (NJPLOT .EQ. 0) NKPLOT = -1	S6208970
	NJPLOT = 1	S6208980
1040	CONTINUE	S6208990
	IX=INT(XSCALE*X)+IX0	S6209000
	IY=INT(YSCALE*Y)+IY0	S6209010
	IF(IX.LT.0.OR.IX.GT.9999.OR.IY.LT.0.OR.IY.GT.9999) GO TO 1110	S6209020
C		S6209030
C	LABEL ISOPLETHS WITH LETTER: A - J	S6209040
C		S6209050
	IF(.NOT.FLGOUT) GO TO 1050	S6209060
	FLGOUT=.FALSE.	S6209070
	GO TO 1120	S6209080
1050	IF(FLGLTR) GO TO 1060	S6209090
	FLGLTR=.TRUE.	S6209100
	FX=AMAX1(AMIN1(0.01*(XSCALE*XMAX+FLOAT(IX0))-0.285,98.9),0.1)	S6209110
	FY=AMAX1(AMIN1(0.01*(YSCALE*YMAX+FLOAT(IY0))-0.5,98.9),0.1)	S6209120
	CALL SYMB(FX,FY,1.0,LETR2,0.0,1)	S6209130
	NDASH=1	S6209140
1060	IF (NOPLOT .NE. 0.OR.NKPLOT .NE. 0) PEN = 3	S6209150
1070	CALL PLOT(0.01*FLOAT(IX),0.01*FLOAT(IY),PEN)	S6209160
	IF (PEN .EQ. 2) IFISOS(N) = 1	S6209170
	IF(IY.LT.4900.OR.IY.GT.5400) GO TO 1080	S6209180
	ITVXX=MAX0(ITVXX,IX)	S6209190
	ITVXN=MIN0(ITVXN,IX)	S6209200
1080	NDASH=NDASH+1	S6209210
	IF(PEN.LT.3.OR.NOPLOT .NE. 0.OR.NKPLOT .EQ. 1) GO TO 1090	S6209220
	PEN=2	S6209230
	GO TO 1070	S6209240
C		S6209250
C	IF RANGE IS LESS THAN RX0, PLOT DASHED ISOPLETHS	S6209260
C		S6209270
1090	IF(R.LT.RX0.AND.MOD(NDASH,3).EQ.0) PEN=3	S6209280
1100	CONTINUE	S6209290
	GO TO 1130	S6209300
1110	PEN=3	S6209310
	IF(FLGOUT) GO TO 1130	S6209320
C		S6209330

C	LABEL DOWNWIND ENDS OF OPEN ISOPLETHS	S6209340
C		S6209350
C	FLGLTR=.FALSE.	S6209360
	FLGOUT=.TRUE.	S6209370
1120	FX=AMAX1(AMIN1(0.01*FLOAT(IX)+0.1,98.9),0.1)	S6209380
	FY=AMAX1(AMIN1(0.01*FLOAT(IY)+0.1,98.9),0.1)	S6209390
	CALL SYMB(FX,FY,1.0,LETR2,0.0,1)	S6209400
	IF(.NOT.FLGOUT) GO TO 1060	S6209410
1130	BO=BEARNG(IABS(NRNG),LNDX)	S6209420
	RO=RANGE(IABS(NRNG),LNDX)	S6209430
	V0=V	S6209440
	S0=SIGYBR(IABS(NRNG),LNDX)	S6209450
1140	NRNG=NRNG+1	S6209460
	IF(NRNG.EQ.0) GO TO 1150	S6209470
	IF(NRNG.GT.30) NRNG=-30	S6209480
	GO TO 920	S6209490
1150	CONTINUE	S6209500
C		S6209510
C		S6209520
C		S6209530
C	ON THE PLOT, CROSS OUT EITHER THE WORD FORECAST OR SOUNDING	S6209540
C		S6209550
1160	IF(ISNDFO) GO TO 1170	S6209560
	CALL PLOT(7.07,6.04,3)	S6209570
	CALL PLOT(11.74,6.04,2)	S6209580
	GO TO 1180	S6209590
C		S6209600
1170	CALL PLOT(12.69,6.04,3)	S6209610
	CALL PLOT(17.60,6.04,2)	S6209620
C		S6209630
C	PRINT OUT FORECAST/SOUNDING TIME ON THE PLOT	S6209640
C		S6209650
1180	LALPH1=13	S6209660
	CALL TMNDT(ISTIME,ISDAY,ISMON,ISYEAR,IALPHA)	S6209670
	CALL SYMB(19.3,5.60,0.80,LALPHA,0.0,1)	S6209680
C		S6209690
C	PRINT OUT THE TIME OF EXECUTION ON THE PLOT	S6209700
C		S6209710
	CALL TMNDT(JTIME,JDAY,JMON,JYEAR,IALPHA)	S6209720
	CALL SYMB(19.30,3.40,0.80,LALPHA,0.0,1)	S6209730
C		S6209740
C	IF THE LAUNCH TIME WAS ENTERED, PRINT IT OUT ON THE PLOT	S6209750
C	ELSE PRINT OUT THE PROGRAM RUN TIME ON THE PLOT.	S6209760
C		S6209770
	CALL TMNDT(LTIME,LDAY,LMON,LYEAR,IALPHA)	S6209780
	CALL SYMB(19.30,1.20,0.80,LALPHA,0.0,1)	S6209790
C		S6209800
C	FOR MODEL 5 OR 6 PLOTS, PRINT NOTATION FOR	S6209810
C	SUM OF LAYERS OR LOWER LAYER ONLY OR LAYER 1 ONLY	S6209820
C	OR LAYER 2 ONLY.	S6209830
C		S6209840
	IF(MODEL.EQ.5.OR.MODEL.EQ.6)	S6209850

C	. CALL SYMB(5.61,8.64,0.8,PSORL(1,(KS+1)/2),0.0,1)	S6209860
C		S6209870
C	ON THE PLOT, PRINT OUT THE CHARACTERS + AND @ FOR THE LEGEND	S6209880
C		S6209890
	1190 CONTINUE	S6209900
	CALL SYMB(10.41,11.24,1.6,AT,0.0,1)	S6209910
	CALL SYMB(10.41,13.52,1.6,ADD,0.0,1)	S6209920
C		S6209930
C	PRINT OUT CALCULATION HEIGHT ON PLOT	S6209940
C		S6209950
	LALPH1=30	S6209960
	CALL CODE	S6209970
	WRITE(IALPHA,9024) CALHT	S6209980
	9024 FORMAT(19H CALCULATION HEIGHT=,F7.1,4H (M))	S6209990
	CALL SYMB(4.81,18.00,0.8,LALPHA,0.0,1)	S6210000
C		S6210010
C	PRINT OUT LOCATION ON PLOT	S6210020
C		S6210030
	LALPH1=17	S6210040
	CALL CODE	S6210050
	WRITE(IALPHA,9025) LOCATN	S6210060
	9025 FORMAT(13HPLOTTED AT: ,2A2)	S6210070
	CALL SYMB(8.0,22.0,0.8,LALPHA,0.0,1)	S6210080
C		S6210090
C	PRINT OUT DATA FILENAME ON THE PLOT	S6210100
C		S6210110
	LALPH1=19	S6210120
	CALL CODE	S6210130
	WRITE(IALPHA,9026) FILE	S6210140
	9026 FORMAT(13H FROM FILE: ,3A2)	S6210150
	CALL SYMB(8.0,20.0,0.8,LALPHA,0.0,1)	S6210160
C		S6210170
C	PRINT OUT SPECIES NAME ON PLOT	S6210180
C		S6210190
	LALPH1=KSPL(IDO)	S6210200
	CALL CODE	S6210210
	WRITE(IALPHA,9009) (KSPECI(I,IDO),I=1,3)	S6210220
	CALL SYMB(7.10,23.80,0.9,LALPHA,0.0,1)	S6210230
CTV		S6210240
CTV	SPECIAL CODING FOR DISPLAY ON TV MONITOR	S6210250
CTV		S6210260
	ITVX=2770	S6210270
	ITVY=8610	S6210280
CTV		S6210290
CTV	Y-COORDINATE OF ALL LAUNCH PADS ON THE LAND MAP IS GREATER THAN	S6210300
CTV	3000	S6210310
CTV		S6210320
	IF(IY0,GT.3000) GO TO 1200	S6210330
CTV		S6210340
CTV	SEA MAP	S6210350
CTV		S6210360
	ITVY=5240	S6210370

ITVX=ITVXX+125	S6210380
CTV	S6210390
CTV IS THE STABILIZATION POINT SOUTH OF THE LAUNCH PAD?	S6210400
CTV	S6210410
IF(ITVXN.LT.3400) GO TO 1200	S6210420
ITVX=ITVXN-750	S6210430
CTV	S6210440
CTV NOW PLOT SPECIES NAME FOR DISPLAY ON THE TV MONITOR	S6210450
CTV	S6210460
1200 CALL SYMB(0.01*FLOAT(ITVX),0.01*FLOAT(ITVY-190),1.25,LALPHA	S6210470
. ,0.0,1)	S6210480
CTV	S6210490
CTV	S6210500
CTV	S6210510
C	S6210520
C PRINT TITLE	S6210530
C	S6210540
LALPH1=35	S6210550
CALL CODE	S6210560
WRITE(IALPHA,9027) TITLE	S6210570
9027 FORMAT(14A2,7H LAUNCH)	S6210580
CALL SYMB(2.01,25.6,0.73,LALPHA,0.0,1)	S6210590
C	S6210600
C PRINT OUT CON, DOS, TIME MEAN CON, DEP, ACIDITY.	S6210610
C	S6210620
LALPH1=KCDTN(JLAB)	S6210630
CALL CODE	S6210640
WRITE(IALPHA,9009) (KCDT(I,JLAB),I=1,(LALPH1+1)/2)	S6210650
. , (WNITS(I,JUNIT),I=1,6)	S6210660
CTV	S6210670
CTV SPECIAL LABEL FOR DISPLAY ON THE TV MONITOR	S6210680
CTV	S6210690
IF(IY0.GT.3000.OR.ITVXN.LT.3400) GO TO 1210	S6210700
ITVX=ITVXN-125*(LALPH1+1)	S6210710
1210 CALL SYMB(0.01*FLOAT(ITVX),0.01*FLOAT(ITVY),1.25,LALPHA,0.0,1)	S6210720
CTV	S6210730
CTV END SPECIAL CODING FOR DISPLAY ON TV MONITOR	S6210740
CTV	S6210750
LALPH1=LALPH1+12	S6210760
CALL SYMB(8.55+0.375*FLOAT(36-LALPH1),99.15,0.75,LALPHA,0.0,1)	S6210770
C	S6210780
C FOR THE LEGEND ON THE PLOT, PRINT OUT THE CON/DEP/pH VALUES	S6210790
C FOR WHICH CONTOURS WERE DRAWN	S6210800
C	S6210810
IXP=900	S6210820
IYP=9752	S6210830
LETR=IHAT	S6210840
DO 1240 I=1,NPLETH	S6210850
LETR=LETR+400B	S6210860
IF(PLETH(I).LE. 0.0)GO TO 1250	S6210870
IF(I .NE. 6) GO TO 1220	S6210880
IXP=2280	S6210890

IYP=9752	S6210900
1220 CONTINUE	S6210910
CALL CODE	S6210920
WRITE(IALPHA,9002) LETR,PLETH(I)	S6210930
LALPHI=13	S6210940
CALL SYMB(0.01*FLOAT(IXP),0.01*FLOAT(IYP),0.95,LALPHA,0.0,1)	S6210950
IF (IFISOS(I) .NE. 0) GO TO 1230	S6210960
XLST = .01*FLOAT(IXP)+0.95*FLOAT(LALPHA(1))	S6210970
YLST = .01*FLOAT(IYP)	S6210980
CALL SYMB(XLST,YLST,0.75,NOISOS,0.0,1)	S6210990
1230 IYP=IYP-140	S6211000
1240 CONTINUE	S6211010
C	S6211020
REMOVE MESSAGE: PLOTTING	S6211030
C	S6211040
1250 IF(CRT) WRITE(ICU,9009) CR,CURSUP,CLRDSP,BKAKO	S6211050
CALL PLOT(99.99,99.99,3)	S6211060
1260 WRITE(ICU,9028) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF	S6211070
9028 FORMAT(51H DO YOU WISH TO PLOT ISOPLETHS FOR ANOTHER VARIABLE/ . 18X,13HOR SPECIES? (,2A2,1HV,2A2,7HARIABLE,2A2,1H,,2A2,1HS,2A2, *7HPECIES,,2A2,1HN,2A2,4HO):_)	S6211080
K=40B	S6211090
CALL EXEC(1,ICU+400B,K,-1)	S6211100
IF(CRT) WRITE(ICU,9009) CURSUP,CURSUP,CLRDSP,BKAKO	S6211110
ASSIGN 220 TO IGO	S6211120
IF (K .EQ. IHS) GO TO 70	S6211130
ASSIGN 80 TO IGO	S6211140
IF(K.EQ.IHV.OR.K.EQ.IBLNK) GO TO 60	S6211150
IF(K.EQ.INJ) GO TO 1270	S6211160
WRITE (ICU,9010) INV,OFF,22,10	S6211170
GO TO 1260	S6211180
1270 CONTINUE	S6211190
C	S6211200
C	S6211210
C	S6211220
CLEAR TABS BEFORE QUITTING AND PUT PEN IN UPPER RIGHT CORNER.	S6211230
C	S6211240
IF(CRT) WRITE(ICU,9009) CR,(TAB,CLRTAB,I=1,5),CR,BKAKO	S6211250
CALL PLOT(99.99,99.99,3)	S6211260
C	S6211270
C	S6211280
C	S6211290
C	S6211300
1280 CONTINUE	S6211310
RETURN	S6211320
C	S6211330
C	S6211340
C	S6211350
END	S6211360

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SUBROUTINE ORGIN(IX0,IY0,DIRNL)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C -----
C -
C - THIS SUBROUTINE GIVES THE APPROPRIATE COORDINATES FOR PLOTTING
C - FOR THE COMPLEX AND MAP SELECTED
C -----
C ***** BEGIN COMMON AREA *****
C 04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
. ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2)
. ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
. FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDF0,CRT,MAXDEP,BATCH,GASSET,GRVSET,
. MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
. SIGZ,ISNDF0,CRT,LAYTOP(3),ITDU,KEEP
. ,MIXING,MAXDEP,LAYBOT(3)
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
. MINUS1,MINUS9,MINUS1,MINUS9,
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
. RT(24),TPROPC,IDXRT
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
. CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
. INVNDR(2),ULINE(2),
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
. CLRLNE,INSLNE,DELNE,
. IESCAJ(3),NULL,IBLNK,
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
C-----VEHICLE PARAMETERS
COMMON /VCLPR/ VPAR(17)

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C-----TIME PARAMETERS	S6300510
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	S6300520
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	S6300530
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)	S6300540
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),	S6300550
RH(30),PTEMP(30),SIGEP(30),SIGAP(30)	S6300560
C-----LAYER PARAMETERS	S6300570
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),	S6300580
SIGYO(29)	S6300590
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)	S6300600
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)	S6300610
C-----CALCULATED NEW LAYER PARAMETERS	S6300620
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),	S6300630
SPEEDN(32)	S6300640
C-----CONVERSION FACTORS	S6300650
COMMON /CNVRT/ QCONV(4),QPDEPH	S6300660
C	S6300670
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****	S6300680
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)	S6300690
C-----READ/WRITE BUFFER	S6300700
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879	S6300710
C*****	S6300720
C	S6300730
C-----EQUIVALENCE STATEMENTS	S6300740
EQUIVALENCE (IPU1,IPAR(3))	S6300750
,(IPU2,IPAR(4)),(IPU3,IPAR(5))	S6300760
EQUIVALENCE (MAXDEP,GRVSET),(IFRMT(1),IFRMT1)	S6300770
C	S6300780
C**** E N D O F C O M M O N A R E A ****	S6300790
Cc	S6300800
C	S6300810
DIMENSION RANGE(30,6),BEARNG(30,6),SIGYBR(30,6),CORSG(30,6)	S6300820
,RCORSG(6),BCORSG(6),XCORSG(6)	S6300830
C-----EQUIVALENCE STATEMENTS	S6300840
EQUIVALENCE	S6300850
.(PLUS,RANGE),(PLUS(181),BEARNG),(PLUS(361),SIGYBR)	S6300860
.,(PLUS(541),XCORSG),(PLUS(547),CORSG),(PLUS(727),RCORSG)	S6300870
.,(PLUS(733),BCORSG)	S6300880
CF OUTPUT FORMAT STATEMENTS	S6300890
CF	S6300900
9001 FORMAT(2A2,7H MOUNT ,6A2,19H MAP ON PLOTTER LU ,I2,10H FOR SITE ,	S6300910
.A2,A1,7H, ENTER,2A2,13H SPACE-RETURN,2A2,11H WHEN READY/	S6300920
.50H OR ENTER AN 'A', IF THE ALTERNATE MAP IS DESIRED?/	S6300930
.66H OR AN 'S', IF YOU WISH TO SPECIFY THE LAUNCH SITE MAP LOCATIONS	S6300940
.?:)	S6300950
9002 FORMAT(2A2/28H ***** PLOTTING IS BASED ON ,6A2,16H MAP COORDINATES	S6300960
.,10H FOR SITE ,A2,A1,5H *****)	S6300970
C	S6300980
C DIMENSION STATEMENT	S6300990
C	S6301000
INTEGER CRSP	S6301010
DIMENSION IX(12),IY(12),LORS(2),IN(2),LORSS(4),NLOC(12)	S6301020

	,DLIMIT(6)	S6301030
	EQUIVALENCE (IN,IN1)	S6301040
C		S6301050
C	DATA STATEMENTS	S6301060
C		S6301070
C		S6301080
C	TERMINAL CONTROL SEQUENCES	S6301090
C		S6301100
	DATA CRSP/6440B/	S6301110
	DATA IHA/1HA/,IHS/1HS/	S6301120
	DATA LORSS/2HLA,2HND,123B,2HEA/	S6301130
	DATA NLOC/2H39,1HA,2H39,1HB,2H39,1HC,2H40,1H ,2H41,1H ,2H17,1H /	S6301140
		S6301150
C		S6301160
C	MAP COORDINATES OF LAUNCH SITES	S6301170
C		S6301180
	DATA IX/4200,4095,3650,3518,3622,3490,5450,5411,4830,4825,8750,	S6301190
	*8730/	S6301200
	DATA IY/1700,7300,1123,6702,0577,6150,2630,8243,2465,8050,2990,	S6301210
	*8600/	S6301220
	DATA DLIMIT/200.0,200.0,200.0,180.0,185.0,180.0/	S6301230
C		S6301240
C	**** FIRST EXECUTABLE STATEMENT.	S6301250
C		S6301260
	10 LNDSEA=0	S6301270
	ISITE = 2*LSITE-1	S6301280
	LORS(1)=LORSS(1)	S6301290
	LORS(2)=LORSS(2)	S6301300
C		S6301310
C	SELECTION OF MAP BASED ON LAUNCH SITE AND WIND DIRECTION	S6301320
C		S6301330
	DIRNL=AMOD(DIRNL,360.0)	S6301340
	ICOORD = LSITE	S6301350
	IF(DIRNL.LE.DLIMIT(ICOORD)) GO TO 20	S6301360
	LNDSEA=-1	S6301370
	LORS(1)=LORSS(3)	S6301380
	LORS(2)=LORSS(4)	S6301390
	20 ICOORD=2*ICOORD+LNDSEA	S6301400
	30 WRITE(ICU,9001) CRSP,CLRDSP,INVHF,LORS,OFF,IPAR(5),NLOC(ISITE),	S6301410
	*NLOC(ISITE+1),ULINE,OFF	S6301420
C		S6301430
C	WAIT UNTIL CORRECT MAP IS ON PLOTTER.	S6301440
C		S6301450
	IN1 = NULL	S6301460
	40 CALL EXEC(1,ICU+400B,IN,2)	S6301470
	IN1=IAND(177400B,IN1)+40B	S6301480
	IF(IN1.EQ.IBLNK) GO TO 80	S6301490
	IF(IN1.EQ.IHA) GO TO 50	S6301500
	IF (IN1.EQ.IHS) GO TO 90	S6301510
	WRITE (ICU,9003) INV,OFF,22,8	S6301520
	9003 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S6301530
	*,I2,1H.,I1/)	S6301540
	GO TO 30	

50	IF (LNDSEA .EQ. 0) GO TO 60	S6301550
	LNDSEA = 0	S6301560
	LORS(1) = LORSS(1)	S6301570
	LORS(2) = LORSS(2)	S6301580
	GO TO 70	S6301590
60	LNDSEA = -1	S6301600
	LORS(1) = LORSS(3)	S6301610
	LORS(2) = LORSS(4)	S6301620
70	ICOORD = LSITE	S6301630
	ICOORD = 2*ICOORD+LNDSEA	S6301640
80	CONTINUE	S6301650
	WRITE(ICU,9002) CURSUP,DELIN,ULINE,LORS,OFF,NLOC(ISITE),NLOC(ISITS	S6301660
	*E+1)	S6301670
C		S6301680
C	SET THE COORDINATES BASED ON THE INDEX I	S6301690
C		S6301700
	IX0 = IX(ICOORD)	S6301710
	IY0 = IY(ICOORD)	S6301720
	GO TO 120	S6301730
90	CONTINUE	S6301740
	WRITE (ICU,9004) CURSUP,DELIN	S6301750
9004	FORMAT (2A2/68H ON A SCALE OF 0 TO 9999 UNITS IN BOTH X AND Y DIRE	S6301760
	*CTIONS, ENTER THE/66H LAUNCH LOCATION (0,0 IS THE LOWER LEFT CORNES	S6301770
	*R OF PLOT BED). X,Y?:)	S6301780
	CALL IFNBR(IFRMT,20,IER,ICU)	S6301790
	IF (IER .EQ. 0) GO TO 100	S6301800
	WRITE (ICU,9003) INV,OFF,22,9	S6301810
	GO TO 90	S6301820
100	CALL CODE(20)	S6301830
	READ (IFRMT,*) SN,WE	S6301840
	IF (SN .EQ. MINS1) GO TO 10	S6301850
	IF (SN .NE. MINS9) GO TO 110	S6301860
	IERROR(1) = 1	S6301870
	NNNEST = 1	S6301880
	CALL REEDM	S6301890
110	IX0 = SN	S6301900
	IY0 = WE	S6301910
	WRITE (ICU,9005) CURSUP,DELIN,INV,OFF	S6301920
9005	FORMAT (2A2/26H *** PLOTTING IS BASED ON ,2A2,14HUSER SPECIFIED,	S6301930
	*2A2,19H LAUNCH COORDINATES)	S6301940
120	CONTINUE	S6301950
C		S6301960
C	RETURN TO THE CALLING PROGRAM	S6301970
C		S6301980
	RETURN	S6301990
C		S6302000
C	END OF ORGIN	S6302010
C		S6302020
	END	S6302030


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SUBROUTINE RMCLM
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6500000
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6500010
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6500020
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6500030
C::: S6500040
C::: S6500050
C::: ORGANIZATION: H. E. CRAMER CO., INC. S6500060
C::: S6500070
C::: WORK FOR: DR. J. B. STEPHENS (ES84) S6500080
C::: S6500090
C::: PROGRAM CODE: RMCLM S6500100
C::: S6500110
C::: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST S6500120
C::: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER) S6500130
C::: S6500140
C::: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS S6500150
C::: S6500160
C::: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS S6500170
C::: S6500180
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6500190
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6500200
C S6500210
C ***** S6500220
C * S6500230
C * CENTERLINE PLOTTING PROGRAM -- A PROGRAM OF THE REED S6500240
C * SERIES OF PROGRAMS S6500250
C * S6500260
C ***** S6500270
Cq S6500280
C**** BEGIN COMMON AREA ***** S6500290
C 04/02/82 S6500300
C-----MATH PARAMETERS AND CONSTANTS S6500310
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S6500320
C-----INPUT OPTIONS S6500330
REAL LAMBDA S6500340
INTEGER FILE,GOOD,TITLE S6500350
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S6500360
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S6500370
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S6500380
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S6500390
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S6500400
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S6500410
. ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S6500420
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S6500430
. FS(20),MDLNAM(12),DBAR(20) S6500440
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S6500450
LOGICAL ISNDF0,CRT,MAXDEP,BATCH,GASSET,GRVSET, S6500460
. MODEL4,MODEL5,MODEL6 S6500470
INTEGER RUNNUM,RT,CL,CS S6500480
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S6500490
DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S6500500

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      .          SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP          S6500510
      .          ,MIXING,MAXDEP,LAYBOT(3)                    S6500520
      .          ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,    S6500530
      .          ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),    S6500540
      .          MINUS1,MINUS9,MINS1,MINS9,                    S6500550
      .          MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S6500560
      .          RT(24),TPROPC,IDXRT                          S6500570
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S6500580
      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,              S6500590
      .          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S6500600
      .          CLRLNE,INSLNE,DELNE                           S6500610
      .          COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S6500620
      .          INVNDR(2),ULINE(2),                           S6500630
      .          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S6500640
      .          CLRLNE,INSLNE,DELNE,                           S6500650
      .          IESCAJ(3),NULL,IBLNK,                         S6500660
      .          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)      S6500670
C-----VEHICLE PARAMETERS                                    S6500680
      COMMON /VCLPR/ VPAR(17)                                  S6500690
C-----TIME PARAMETERS                                       S6500700
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S6500710
      .          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)    S6500720
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S6500730
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S6500740
      .          RH(30),PTEMP(30),SIGEP(30),SIGAP(30)           S6500750
C-----LAYER PARAMETERS                                       S6500760
      COMMON /LAYER/ DX,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S6500770
      .          SIGYO(29)                                       S6500780
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)           S6500790
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)                S6500800
C-----CALCULATED NEW LAYER PARAMETERS                       S6500810
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S6500820
      .          SPEEDN(32)                                       S6500830
C-----CONVERSION FACTORS                                     S6500840
      COMMON /CNVRT/ QCONV(4),QPDEPH                           S6500850
C                                                             S6500860
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S6500870
      COMMON /EXTRA/      NCOM(1),      NTOTAL(1),      PLUS(900) S6500880
C-----READ/WRITE BUFFER                                     S6500890
C-----A R R A Y      = 2077 + 1 + 1 + 2 * 900 = 3879S6500900
C*****S6500910
C                                                             S6500920
C-----EQUIVALENCE STATEMENTS                                S6500930
      EQUIVALENCE (IPU1,IPAR(3))                                S6500940
      .          , (IPU2,IPAR(4)), (IPU3,IPAR(5))              S6500950
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)           S6500960
C                                                             S6500970
C*****          E N D   O F   C O M M O N   A R E A          ****S6500980
Cc                                                             S6500990
C                                                             S6501000
      DIMENSION RANGE(30,6),BEARNG(30,6),SIGYBR(30,6),CORSG(30,6) S6501010
      . ,RCORSG(6),BCORSG(6),XCORSG(6)                         S6501020

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C-----	EQUIVALENCE STATEMENTS	S6501030
	EQUIVALENCE	S6501040
	. (PLUS,RANGE),(PLUS(181),BEARNG),(PLUS(361),SIGYBR)	S6501050
	. ,(PLUS(541),XCORSG),(PLUS(547),CORSG),(PLUS(727),RCORSG)	S6501060
	. ,(PLUS(733),BCORSG)	S6501070
C		S6501080
C	TYPE AND DIMENSION STATEMENTS	S6501090
C		S6501100
	LOGICAL IGRAF,FLGSPC(4),TO	S6501110
	INTEGER CRLF,YORNO,CR,BGLINE,DFLT,YUNITS,YUNIT(3,4),PTITL(12,3)	S6501120
	. ,PDO,BKAKO,ZIP,BKARO	S6501130
	DIMENSION LLABEL(17),LPLLNT(3,4),IP(5),IN(2),LSPECI(11,4)	S6501140
	. ,LPAREN(2),IALPHA(50),YORNO(16),JSPECI(3,4),L1(3),IBUFR(71)	S6501150
	. ,IREG(2),ZIP(5)	S6501160
	EQUIVALENCE (IN,IN1),(L1(2),L3),(REG,IREG,IA),(IREG(2),IB)	S6501170
C		S6501180
C	DATA STATEMENTS	S6501190
C		S6501200
	DATA LPLLNT/OB,2HHC,2HL ,OB,2HCO,2H2 ,OB,2HCO,OB,2HAL	S6501210
	. ,2H2O,2H3 /	S6501220
	DATA LPAREN,BKARO,CRLF,CR,BKAKO,ZIP	S6501230
	. /2H(,2H),20137B,6412B,15B,137B,5*0/	S6501240
	DATA PTITL	S6501250
	. /2HCO,2HNC,2HEN,2HTR,2HAT,2HIO,2HN ,2HAN,2HD ,2HDO,2HSA,2HGE	S6501260
	. ,2HWA,2HSH,2HOU,2HT ,2HDE,2HPO,2HSI,2HTI,2HON,3*1H	S6501270
	. ,2HGR,2HAV,2HIT,2HAT,2HIO,2HNA,2HL ,2HDE,2HPO,2HSI,2HTI,2HON/	S6501280
	DATA JSPECI	S6501290
	. /2H ,2H H,2HCL	S6501300
	. ,2H ,2H C,2HO2	S6501310
	. ,2H ,2H ,2HCO	S6501320
	. ,2H A,2HL2,2HO3/	S6501330
	DATA YUNIT/2,4,0	S6501340
	. ,2,0,0	S6501350
	. ,2,0,0	S6501360
	. ,1,3,5/	S6501370
	DATA LSPECI	S6501380
	. /15446B,62104B,110B,15446B,62100B,2HCL,15446B,62100B,OB,15446B	S6501390
	. ,62100B	S6501400
	. ,15446B,62104B,103B,15446B,62100B,117B,15446B,62104B,62B,15446B	S6501410
	. ,62100B	S6501420
	. ,15446B,62104B,103B,15446B,62100B,117B,15446B,62100B,OB,15446B	S6501430
	. ,62100B	S6501440
	. ,15446B,62104B,101B,15446B,62100B,2HL2,15446B,62100B,2HO3,15446B	S6501450
	. ,62100B/	S6501460
	DATA YORNO	S6501470
	. /15446B,62106B,131B,15446B,62102B,2HES,15446B,62100B,2H O,2HR	S6501480
	. ,15446B,62104B,116B,15446B,62100B,117B/	S6501490
	DATA ICOMMA/26000B/	S6501500
	DATA IH2,IHM,IHP/1H2,IHM,IHP/	S6501510
C		S6501520
C	FIRST EXECUTABLE STATEMENT	S6501530
C		S6501540

C		S6501550
C	SELECT VARIABLES AND POLLUTANTS TO BE PLOTTED.	S6501560
C		S6501570
	IF(CRT) GO TO 40	S6501580
	K=0	S6501590
	DO 30 I=1,5	S6501600
	IF(I.EQ.5) GO TO 20	S6501610
	DO 10 J=1,4	S6501620
	LSPECI(3*I-1,J) = NULL	S6501630
	LSPECI(3*I-2,J) = NULL	S6501640
10	CONTINUE	S6501650
	IF(I.EQ.4) K=1	S6501660
20	YORNO(3*I+K-2) = NULL	S6501670
	YORNO(3*I+K-1) = NULL	S6501680
30	CONTINUE	S6501690
40	WRITE(ICU,9001) SETTAB,CR,BKAKO	S6501700
9001	FORMAT(59X,3A2)	S6501710
	IVARP=0	S6501720
50	NSPECI=0	S6501730
	NWDS=0	S6501740
	JM112=0	S6501750
	IF(MODEL.EQ.6) IPLLNT(1)=4	S6501760
	DO 70 J=1,4	S6501770
	IF(IPLLNT(J).LE.0) GO TO 80	S6501780
	IF(MODEL.GT.4.AND.(IPLLNT(J).EQ.2.OR.IPLLNT(J).EQ.3)) GO TO 70	S6501790
	NWDS=NWDS+12	S6501800
	NSPECI=NSPECI+1	S6501810
	FLGSPC(IPLLNT(J))=.TRUE.	S6501820
	DO 60 I=1,11	S6501830
	IALPHA(I+JM112)=LSPECI(I,IPLLNT(J))	S6501840
60	CONTINUE	S6501850
	IALPHA(NWDS)=ICOMMA	S6501860
	JM112=NWDS	S6501870
70	CONTINUE	S6501880
80	IALPHA(NWDS)=LPAREN(2)	S6501890
C		S6501900
C	NO PROMPT FOR ONLY ONE SPECIES	S6501910
C		S6501920
	IF(NSPECI.LT.2) GO TO 110	S6501930
C		S6501940
C	INVERSE VIDEO FOR DEFAULT	S6501950
C		S6501960
	DO 90 J=2,8,3	S6501970
	IALPHA(J+12*IVARP)=IOR(IALPHA(J+12*IVARP),2B)	S6501980
90	CONTINUE	S6501990
100	WRITE(ICU,9002)	S6502000
	WRITE(ICU,9005) LPAREN(1),(IALPHA(I),I=1,NWDS),BKARO	S6502010
9002	FORMAT(39H PLOT MAXIMUM CENTERLINE VALUES FOR: _)	S6502020
	L1 = NULL	S6502030
	CALL EXEC(1,ICU+400B,L1,3)	S6502040
9003	FORMAT(5A1)	S6502050
	L2=IAND(L1,377B)	S6502060

	L1=IAND(L1,177400B)	S6502070
C		S6502080
C	ERASE PROMPT	S6502090
C		S6502100
	WRITE(ICU,9005) CR,CURSUP,CLRDSP,BKAKO	S6502110
	IF(L1.NE.20000B) GO TO 120	S6502120
C		S6502130
C	DEFAULT	S6502140
C		S6502150
	110 IDO=IPLNT(IVARP+1)	S6502160
	IF(IDO.GT.0) GO TO 210	S6502170
	IDO=IPLNT(1)	S6502180
	IVARP=0	S6502190
	GO TO 210	S6502200
	120 IF(L1.NE.44000B.OR..NOT.FLGSPC(1)) GO TO 130	S6502210
C		S6502220
C	HCL SELECTED	S6502230
C		S6502240
	IDO=1	S6502250
	GO TO 210	S6502260
	130 IF(L1.NE.40400B.OR..NOT.FLGSPC(4)) GO TO 140	S6502270
C		S6502280
C	AL203 SELECTED	S6502290
C		S6502300
	IDO=4	S6502310
	GO TO 210	S6502320
	140 IF(L1.EQ.41400B.AND.(FLGSPC(3).OR.FLGSPC(2))) GO TO 160	S6502330
C		S6502340
C	BAD ENTRY PROCESSING	S6502350
C		S6502360
	150 WRITE (ICU,9004) INV,OFF,21,2	S6502370
	9004 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S6502380
	*,I2,IH.,I1/)	S6502390
	9005 FORMAT(52A2)	S6502400
	GO TO 100	S6502410
C		S6502420
C	CO2 AND CO	S6502430
C		S6502440
	160 IF(L2.NE.62B.OR..NOT.FLGSPC(2)) GO TO 180	S6502450
C		S6502460
C	CO2 SELECTED	S6502470
C		S6502480
	170 IDO=2	S6502490
	GO TO 210	S6502500
	180 IF(L2.NE.40B.OR..NOT.FLGSPC(3)) GO TO 200	S6502510
C		S6502520
C	CO SELECTED	S6502530
C		S6502540
	190 IDO=3	S6502550
	GO TO 210	S6502560
	200 IF(L2.NE.117B) GO TO 150	S6502570
	IF((L3.EQ.IBLNK.OR.L3.EQ.0B).AND.FLGSPC(3)) GO TO 190	S6502580

	IF(L3.EQ.IH2.AND.FLGSPC(2)) GO TO 170	S6502590
	GO TO 150	S6502600
C		S6502610
C	INITIALIZE THE PLOTTER	S6502620
C		S6502630
	210 CALL PLTLU(IPU2)	S6502640
	CALL SFACT(33.0,24.0)	S6502650
	CALL LLEFT	S6502660
	PDO=3	S6502670
	IF(MODEL.LT.5) GO TO 220	S6502680
	PDO=1	S6502690
	IF(LAYTOP(2).GT.0) PDO=8-MODEL	S6502700
	220 QF=QCONV(IDO)	S6502710
	YUNITS=YUNIT(MODEL-3,IDO)	S6502720
	IF(MODEL.LT.6) GO TO 240	S6502730
	WRITE(ICU,9006) INVNDR,INV,OFF,ULINE,OFF,BKARO	S6502740
	9006 FORMAT(21H PLOT DEPOSITION IN (,2A2,1HM,2A2,9HILLIGRAMS,2A2,4H OR	S6502750
	.,2A2,1HP,2A2,14HARTICLES/M**2),A2)	S6502760
	K = IHM	S6502770
	CALL EXEC(1,ICU+400B,K,-1)	S6502780
	WRITE(ICU,9005) CURSUP,DELINE,BKAKO	S6502790
	IF(K.EQ.IBLNK.OR.K.EQ.IHM) GO TO 240	S6502800
	IF(K.EQ.IHP) GO TO 230	S6502810
	WRITE (ICU,9004) INV,OFF,21,3	S6502820
	GO TO 220	S6502830
	230 CONTINUE	S6502840
	YUNITS=6	S6502850
C		S6502860
C	PLOT THE CENTERLINE DOSAGE AND CONCENTRATION VALUES	S6502870
C		S6502880
C		S6502890
C	DISPLAY PLOTTING	S6502900
C		S6502910
	240 WRITE(ICU,9007) BLNKNG,OFF	S6502920
	CALL LABEL(PDO,IDO,YUNITS,MODEL)	S6502930
	9007 FORMAT(10X,2A2,8HPLOTTING,3A2)	S6502940
	CALL CPLOT(PDO,IDO,YUNITS,MODEL)	S6502950
	WRITE(ICU,9005) CR,CURSUP,CLRDSP,BKAKO	S6502960
	WRITE(ICU,9008) (PTITL(I,MODEL-3),I=1,12),(JSPECI(I,IDO)	S6502970
	,I=1,3)	S6502980
	9008 FORMAT(20H MAXIMUM CENTERLINE ,12A2,16H PLOTTED FOR: ,5A2)	S6502990
	IVARP=MOD(IVARP+1,NSPECI)	S6503000
C		S6503010
C	PUT THE PEN IN THE UPPER RIGHT CORNER AND CLEAR THE TAB	S6503020
C		S6503030
	WRITE(ICU,9005) CR,TAB,CLRTAB,CR,BKAKO	S6503040
	250 WRITE(ICU,9009) YORNO,BKARO	S6503050
	9009 FORMAT(62H DO YOU WISH TO PLOT CENTERLINE PROFILES FOR ANOTHER SPES	S6503060
	.CIES?(,16A2,1H),A2)	S6503070
	K = IBLNK	S6503080
	CALL EXEC(1,ICU+400B,K,-1)	S6503090
	WRITE(ICU,9005) CURSUP,CURSUP,CLRDSP,BKAKO	S6503100

IF(K.EQ.IBLNK.OR.K.EQ.IYSJ) GO TO 260	S6503110
IF(K.EQ.INJ) GO TO 270	S6503120
WRITE (ICU,9004) INV,OFF,21,4	S6503130
GO TO 250	S6503140
260 NNNTRY=5	S6503150
GO TO 280	S6503160
270 NNNTRY = 6	S6503170
280 CONTINUE	S6503180
CALL URITE	S6503190
C	S6503200
C RETURN	S6503210
C	S6503220
RETURN	S6503230
C	S6503240
C END OF RMCLM	S6503250
C	S6503260
END	S6503270

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SUBROUTINE CPLOT(PDO,IDO,YUNITS,IP)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C
C -----S6600000
C -S6600010
C -S6600020
C -S6600030
C -S6600040
C - THIS SUBROUTINE PLOTS THE CENTERLINE CURVES -S6600050
C -S6600060
C -----S6600070
CqS6600080
C****          B E G I N C O M M O N   A R E A          ****S6600090
C 04/02/82S6600100
C-----MATH PARAMETERS AND CONSTANTS S6600110
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S6600120
C-----INPUT OPTIONS S6600130
REAL LAMBDA S6600140
INTEGER FILE,GOOD,TITLE S6600150
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S6600160
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S6600170
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S6600180
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S6600190
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S6600200
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S6600210
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S6600220
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S6600230
. FS(20),MDLNAM(12),DBAR(20) S6600240
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S6600250
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S6600260
. MODEL4,MODEL5,MODEL6 S6600270
INTEGER RUNNUM,RT,CL,CS S6600280
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S6600290
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S6600300
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S6600310
. ,MIXING,MAXDEP,LAYBOT(3) S6600320
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S6600330
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S6600340
. MINUS1,MINUS9,MINS1,MINS9, S6600350
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S6600360
. RT(24),TPROPC,IDXRT S6600370
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S6600380
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S6600390
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S6600400
. CLRLNE,INSLNE,DELNE S6600410
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S6600420
. INVNDR(2),ULINE(2), S6600430
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S6600440
. CLRLNE,INSLNE,DELNE, S6600450
. IESCAJ(3),NULL,IBLNK, S6600460
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S6600470
C-----VEHICLE PARAMETERS S6600480
COMMON /VCLPR/ VPAR(17) S6600490
C-----TIME PARAMETERS S6600500

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COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,      S6600510
.      LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)      S6600520
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)      S6600530
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),      S6600540
.      RH(30),PTEMP(30),SIGEP(30),SIGAP(30)      S6600550
C-----LAYER PARAMETERS      S6600560
COMMON /LAYER/ DX, DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),      S6600570
.      SIGYO(29)      S6600580
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)      S6600590
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)      S6600600
C-----CALCULATED NEW LAYER PARAMETERS      S6600610
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),      S6600620
.      SPEEDN(32)      S6600630
C-----CONVERSION FACTORS      S6600640
COMMON /CNVRT/ QCONV(4),QPDEPH      S6600650
C      S6600660
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S6600670
COMMON /EXTRA/      NCOM(1),      NTOTAL(1),      PLUS(900)      S6600680
C-----READ/WRITE BUFFER      S6600690
C-----A R R A Y      = 2077 + 1      + 1      + 2 * 900      = 3879S6600700
C*****S6600710
C      S6600720
C-----EQUIVALENCE STATEMENTS      S6600730
EQUIVALENCE (IPU1,IPAR(3))      S6600740
.      , (IPU2,IPAR(4)), (IPU3,IPAR(5))      S6600750
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)      S6600760
C      S6600770
C****      E N D O F C O M M O N A R E A      ****S6600780
Cc      S6600790
C      S6600800
DIMENSION RANGE(30,6),BEARNG(30,6),SIGYBR(30,6),CORSG(30,6)      S6600810
.      ,RCORSG(6),BCORSG(6),XCORSG(6)      S6600820
C-----EQUIVALENCE STATEMENTS      S6600830
EQUIVALENCE      S6600840
.      (PLUS,RANGE), (PLUS(181),BEARNG), (PLUS(361),SIGYBR)      S6600850
.      , (PLUS(541),XCORSG), (PLUS(547),CORSG), (PLUS(727),RCORSG)      S6600860
.      , (PLUS(733),BCORSG)      S6600870
C      S6600880
C      DIMENSION STATEMENT      S6600890
C      S6600900
C      S6600910
C** THE VARIABLE NAME "PLUS" WAS CHANGED NOV 9, 1979 BECAUSE OF A CONFLIS6600920
C** ARISING WITH THE LABLED COMMON DEVICE...J.S.H.      S6600930
C      S6600940
DIMENSION YDIST(6)      S6600950
INTEGER ADD(2),PEN,O(2),PDO,PDOP,YUNITS,GASORA,IALPHA(12)      S6600960
.      ,LALPHA(2)      S6600970
EQUIVALENCE (LALPHA(2),IALPHA), (LALPHA,LALPH1)      S6600980
DATA FXDIST/1.0/      S6600990
.      ,ADD/1,1H+/,D2RAD/0.01745329/,O/1,1HO/      S6601000
DATA YDIST/11.04,12.24,14.84,0.0,15.44,14.24/      S6601010
C      S6601020

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C	STATEMENT FUNCTION FOR PH	S6601030
C		S6601040
	FIY(L)=16.4-2.0*AMAX1(0.0,AMIN1(7.0,-ALOGT(CORSG(NRNG,L))))	S6601050
C		S6601060
C	CALCULATE AND PLOT INTEGER SCALING FACTOR [DOSAGE OR MODELS 5	S6601070
C		S6601080
	GASORA=3*(IDO/4)	S6601090
	IF(YUNITS.EQ.6) GASORA=0	S6601100
	YDIST1=16.34	S6601110
	IF(IP.GT.4.AND.IDO.NE.1)	S6601120
	EX=ALOGT(AMAX1(XCORSG(GASORA+1),XCORSG(GASORA+3))*QCONV(IDO))	S6601130
	IF(IP.EQ.4) EX=ALOGT(XCORSG(GASORA+2)*QCONV(IDO))	S6601140
	IEXP=EX	S6601150
	IF(EX.LT.0.0) IEXP=IEXP-1	S6601160
	LALPH1=2	S6601170
	IEXP=-IEXP	S6601180
	CALL CODE	S6601190
	WRITE(IALPHA,9001) IEXP	S6601200
9001	FORMAT(I2)	S6601210
	IF(IP.LT.5)CALL SYMB(0.8,YDIST1,0.2,LALPHA,90.0,1)	S6601220
	PFAC1=20.0*QCONV(IDO)*10.0**(IEXP-1)	S6601230
	PFAC=PFAC1	S6601240
	GO TO (90,50,10),PDO	S6601250
C		S6601260
C	PLOT SYMBOLS 'O' FOR UPPER LAYER OR TIME MEAN CONCENTRATION	S6601270
C		S6601280
	10 NRNG=1	S6601290
	IF(IP.GT.4) GO TO 20	S6601300
C		S6601310
C	SCALE FACTOR FOR TIME MEAN CONCENTRATION IS THE SAME	S6601320
C	AS FOR CONCENTRATION	S6601330
C		S6601340
	EX=ALOGT(XCORSG(GASORA+1)*QCONV(IDO))	S6601350
	IEXP=EX	S6601360
	IF(EX.LT.0.0) IEXP=IEXP-1	S6601370
	IEXP=-IEXP	S6601380
	PFAC=20.0*QCONV(IDO)*10.0**(IEXP-1)	S6601390
20	IF(RANGE(NRNG,PDO+GASORA).LE.0.0) GO TO 30	S6601400
	X=0.001*RANGE(NRNG,PDO+GASORA)+2.37	S6601410
	Y=PFAC*CORSG(NRNG,PDO+GASORA)+2.4	S6601420
C		S6601430
C	PH PLOTTED?	S6601440
C		S6601450
	IF(IP.EQ.5.AND.IDO.EQ.1) Y=FIY(PDO)	S6601460
	IF(X.LT.2.50.OR.X.GT.32.5.OR.Y.LT.2.5.OR.Y.GT.22.5) GO TO 30	S6601470
	CALL SYMB(X,Y,0.2,0,0.0,1)	S6601480
30	NRNG=NRNG+1	S6601490
	IF(NRNG.LT.31) GO TO 20	S6601500
C		S6601510
C	PLOT SYMBOLS '+' FOR LOWER LAYER OR DOSAGE	S6601520
C		S6601530
	40 PDO=2	S6601540

IF(IP.EQ.4) PFAC=PFAC1	S6601550
PDOP=2	S6601560
50 NRNG=1	S6601570
60 IF(RANGE(NRNG,PDO+GASORA).LE.0.0) GO TO 70	S6601580
X=0.001*RANGE(NRNG,PDO+GASORA)+2.37	S6601590
Y=PFAC*CORSNG(NRNG,PDO+GASORA)+2.4	S6601600
C	S6601610
C PH PLOTTED?	S6601620
C	S6601630
IF(IP.EQ.5.AND.IDO.EQ.1) Y=FIY(PDO)	S6601640
IF(X.LT.2.5.OR.X.GT.32.5.OR.Y.LT.2.5.OR.Y.GT.22.5) GO TO 70	S6601650
CALL SYMB(X,Y,0.2,ADD,0.0,1)	S6601660
70 NRNG=NRNG+1	S6601670
IF(NRNG.LT.31) GO TO 60	S6601680
C	S6601690
C PLOT LINE FOR COMBINED LAYERS OR CONCENTRATION	S6601700
C	S6601710
80 PDO=1	S6601720
PDOP=1	S6601730
90 NRNG=1	S6601740
PEN=3	S6601750
IF(IP.GT.4) GO TO 100	S6601760
C	S6601770
C CALCULATE SCALE FACTOR FOR CONCENTRATION	S6601780
C	S6601790
EX=ALOGT(XCORSNG(PDO+GASORA)*QCONV(IDO))	S6601800
IEXP=EX	S6601810
IF(EX.LT.0.0) IEXP=IEXP-1	S6601820
IEXP=-IEXP	S6601830
CALL CODE	S6601840
WRITE(IALPHA,9001) IEXP	S6601850
PFAC=20.0*QCONV(IDO)*10.0**(IEXP-1)	S6601860
100 IF(YDIST(YUNITS).GT.0.0)	S6601870
. CALL SYMB(0.8,YDIST(YUNITS),0.2,LALPHA,90.0,1)	S6601880
110 IF(RANGE(NRNG,PDO+GASORA).LE.0.0) GO TO 130	S6601890
X=0.001*RANGE(NRNG,PDO+GASORA)+2.5	S6601900
Y=PFAC*CORSNG(NRNG,PDO+GASORA)+2.5	S6601910
C	S6601920
C PH PLOTTED?	S6601930
C	S6601940
IF(IP.EQ.5.AND.IDO.EQ.1) Y=FIY(PDO)+0.1	S6601950
IF(X.LT.2.5.OR.X.GT.32.5.OR.Y.LT.2.5.OR.Y.GT.22.5) GO TO 130	S6601960
120 CALL PLOT(X,Y,PEN)	S6601970
9002 FORMAT(1X3A2,I3,6I7,2G12.4/12G11.4/12G11.4)	S6601980
IF(PEN.LT.3) GO TO 130	S6601990
PEN=2	S6602000
GO TO 120	S6602010
130 NRNG=NRNG+1	S6602020
IF(NRNG.LT.31) GO TO 110	S6602030
140 CALL PLOT(33.0,24.0,3)	S6602040
C	S6602050
C RETURN TO RCONC	S6602060

C
RETURN
C
END OF CPLOT
C
END

S6602070
S6602080
S6602090
S6602100
S6602110
S6602120

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C - - - - - S6700000
C S6700010
C S6700020
C S6700030
C - - - - - S6700040
  SUBROUTINE LABEL(PDO,IDO,YUNITS,IP) S6700050
  . , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC S6700060
C S6700070
C -----S6700080
C - S6700090
C - THIS SUBROUTINE LABELS THE CONCENTRATION AND DOSAGE CENTERLINE S6700100
C - PLOTS S6700110
C - S6700120
C -----S6700130
Cc S6700140
C****          B E G I N   C O M M O N   A R E A          ****S6700150
C 04/02/82 S6700160
C-----MATH PARAMETERS AND CONSTANTS S6700170
  COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S6700180
C-----INPUT OPTIONS S6700190
  REAL LAMBDA S6700200
  INTEGER FILE,GOOD,TITLE S6700210
  COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S6700220
  . ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S6700230
  . XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S6700240
  . IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S6700250
  . ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S6700260
  . ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2) S6700270
  . ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S6700280
  . TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S6700290
  . FS(20),MDLNAM(12),DBAR(20) S6700300
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S6700310
  LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S6700320
  . MODEL4,MODEL5,MODEL6 S6700330
  INTEGER RUNNUM,RT,CL,CS S6700340
  COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S6700350
  . DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S6700360
  . SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S6700370
  . ,MIXING,MAXDEP,LAYBOT(3) S6700380
  . ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S6700390
  . ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S6700400
  . MINUS1,MINUS9,MIN51,MIN59, S6700410
  . MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S6700420
  . RT(24),TPROPC,IDXRT S6700430
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S6700440
  INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S6700450
  . TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S6700460
  . CLRLNE,INSLNE,DELINE S6700470
  COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S6700480
  . INVNDR(2),ULINE(2), S6700490
  . TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S6700500

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      :          CLRLNE,INSLNE,DELIN,          S6700510
      :          IESCAJ(3),NULL,IBLNK,          S6700520
      :          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S6700530
C-----VEHICLE PARAMETERS          S6700540
      COMMON /VCLPR/ VPAR(17)          S6700550
C-----TIME PARAMETERS          S6700560
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S6700570
      LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)          S6700580
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S6700590
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S6700600
      RH(30),PTEMP(30),SIGEP(30),SIGAP(30)          S6700610
C-----LAYER PARAMETERS          S6700620
      COMMON /LAYER/ DX,DY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S6700630
      SIGYO(29)          S6700640
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)          S6700650
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)          S6700660
C-----CALCULATED NEW LAYER PARAMETERS          S6700670
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S6700680
      SPEEDN(32)          S6700690
C-----CONVERSION FACTORS          S6700700
      COMMON /CNVRT/ QCONV(4),QPDEPH          S6700710
C          S6700720
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S6700730
      COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)          S6700740
C-----READ/WRITE BUFFER          S6700750
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S6700760
C*****S6700770
C          S6700780
C-----EQUIVALENCE STATEMENTS          S6700790
      EQUIVALENCE (IPU1,IPAR(3))          S6700800
      , (IPU2,IPAR(4)), (IPU3,IPAR(5))          S6700810
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)          S6700820
C          S6700830
C****          S6700840
      E N D O F C O M M O N A R E A          S6700850
C          S6700860
C          S6700870
      DIMENSION RANGE(30,6),BEARNG(30,6),SIGYBR(30,6),CORSG(30,6) S6700880
      ,RCORSG(6),BCORSG(6),XCORSG(6)          S6700890
C-----EQUIVALENCE STATEMENTS          S6700900
      EQUIVALENCE          S6700910
      , (PLUS,RANGE), (PLUS(181),BEARNG), (PLUS(361),SIGYBR) S6700920
      , (PLUS(541),XCORSG), (PLUS(547),CORSG), (PLUS(727),RCORSG) S6700930
      , (PLUS(733),BCORSG)          S6700940
      COMPLEX CYLAB1(7),CYLAB2(7),CYLAB3(7),CYLAB4(7),CYLAB5(7) S6700950
      ,CYLAB6(7)          S6700960
      INTEGER PDO,YLAB(32,6),YUNITS,PLGND(15,7),PTITL(13,3) S6700970
      DIMENSION IALPHA(18),LPLLNT(6,4),LALPHA(2)          S6700980
      EQUIVALENCE (LALPHA(2),IALPHA), (LALPHA,LALPH1) S6700990
      , (YLAB(2,1),CYLAB1), (YLAB(2,2),CYLAB2), (YLAB(2,3),CYLAB3) S6701000
      , (YLAB(2,4),CYLAB4), (YLAB(2,5),CYLAB5), (YLAB(2,6),CYLAB6) S6701010
      DATA LPLLNT/2H F,2HOR,2H H,2HCL,2H ,8 S6701020
      ,2H F,2HOR,2H C,2HO2,2H ,8

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.	,2H F,2HOR,2H C,2HO ,2H ,8	S6701030
.	,2H F,2HOR,2H A,2HL2,2HO3,10/	S6701040
	DATA PLGND	S6701050
.	/22,4*2H ,2H C,2HON,2HCE,2HNT,2HRA,2HTI,2HON,3*20040B	S6701060
.	,15,4*2H+ ,2H D,2HOS,2HAG,2HE ,6*20040B	S6701070
.	,28,4*2HO ,2H ,2H ,2H M,2HIN,2H. ,2HAV,2HE ,2HCO,2HNC,20040B	S6701080
.	,19,4*2H ,2H D,2HEP,2HOS,2HIT,2HIO,2HN ,4*20040B	S6701090
.	,16,4*2H ,2H A,2HCI,2HDI,2HTY,6*20040B	S6701100
.	,20,4*2HO ,2H U,2HPP,2HER,2H L,2HAY,2HER,4*20040B	S6701110
.	,20,4*2H+ ,2H L,2HOW,2HER,2H L,2HAY,2HER,4*2H /	S6701120
	DATA PTITL	S6701130
.	/24,2HCO,2HNC,2HEN,2HTR,2HAT,2HIO,2HN ,2HAN,2HD ,2HDO,2HSA,2HGE	S6701140
.	,18,2HWA,2HSH,2HOU,2HT ,2HDE,2HPO,2HSI,2HTI,2HON,3*20040B	S6701150
.	,24,2HGR,2HAV,2HIT,2HAT,2HIO,2HNA,2HL ,2HDE,2HPO,2HSI,2HTI,2HON/	S6701160
	DATA CYLAB1 /8HCONCENTR,8HATION X ,8H10 [MG/M	S6701170
.	,8H**3] - ,8H DOSAGE ,8HX 10 [MG,8H-SEC/M**/	S6701180
	DATA CYLAB2 /8H CO,8HNCENTRAT,8HION X 10	S6701190
.	,8H [PPM] -,8H DOSAGE ,8HX 10 [PP,8HM-SEC] /	S6701200
	DATA CYLAB3 /8H ,8H WAS,8HHOUT DEP	S6701210
.	,8HOSITION ,8HX 10 [MG,8H/M**2] ,8H /	S6701220
	DATA CYLAB4 /8H ,8H ,8H WASHOUT	S6701230
.	,8H DEPOSIT,8HION [PH],8H ,8H /	S6701240
	DATA CYLAB5 /8H ,8H GRAVIT,8HATIONAL	S6701250
.	,8HDEPOSITI,8HON X 10 ,8H[MG/M**2,8H] /	S6701260
	DATA CYLAB6 /8H GRA,8HVITATION,8HAL DEPOS	S6701270
.	,8HITION X ,8H10 [PART,8HICLES/M*,8H*2] /	S6701280
	DATA YLAB(1,1),YLAB(30,1),YLAB(31,1),YLAB(32,1)	S6701290
.	,YLAB(1,2),YLAB(30,2),YLAB(31,2),YLAB(32,2)	S6701300
.	,YLAB(1,3),YLAB(30,3),YLAB(31,3),YLAB(32,3)	S6701310
.	,YLAB(1,4),YLAB(30,4),YLAB(31,4),YLAB(32,4)	S6701320
.	,YLAB(1,5),YLAB(30,5),YLAB(31,5),YLAB(32,5)	S6701330
.	,YLAB(1,6),YLAB(30,6),YLAB(31,6),YLAB(32,6)	S6701340
.	/ 58, 2H3], 41, 68	S6701350
.	, 54, 2H , 47, 68	S6701360
.	, 46, 2H , 58, 0	S6701370
.	, 40, 2H , 0, 0	S6701380
.	, 49, 2H , 64, 0	S6701390
.	, 53, 2H , 58, 0/	S6701400
C		S6701410
CF	OUTPUT FORMAT STATEMENTS	S6701420
CF		S6701430
	9001 FORMAT(I2)	S6701440
	9002 FORMAT(F5.0)	S6701450
	9003 FORMAT(F4.1)	S6701460
	9004 FORMAT(I4,2A2,I3,1X,A2,A1,1X,I4)	S6701470
	9005 FORMAT (55A2)	S6701480
	9006 FORMAT (F4.1)	S6701490
C		S6701500
C	FIRST EXECUTABLE STATEMENT	S6701510
C		S6701520
	GASORA=3*(IDO/4)	S6701530
	IPM3=IP-3	S6701540

LALPH1=4	S6702590
CALL CODE	S6702600
WRITE(IALPHA,9005) LOCATN	S6702610
CALL SYMB(20.5,21.0,0.2,LALPHA,0.0,1)	S6702620
C	S6702630
C PRINT OUT THE DATA FILENAME ON THE PLOT	S6702640
C	S6702650
LALPH1=6	S6702660
CALL CODE	S6702670
WRITE(IALPHA,9005) FILE	S6702680
CALL SYMB(20.5,20.5,0.2,LALPHA,0.0,1)	S6702690
C	S6702700
C CROSS OUT SOUNDING/FORECAST AS APPROPRIATE	S6702710
C	S6702720
IF(ISNDFO)GO TO 90	S6702730
CALL PLOT(18.6,22.6,3)	S6702740
CALL PLOT(20.2,22.6,2)	S6702750
GO TO 100	S6702760
90 CALL PLOT(16.6,22.6,3)	S6702770
CALL PLOT(18.4,22.6,2)	S6702780
100 CONTINUE	S6702790
C	S6702800
C PLOT LEGENDS	S6702810
C	S6702820
CALL PLOT(25.5,22.5,3)	S6702830
CALL PLOT(26.8,22.5,2)	S6702840
CALL PLOT(26.8,22.5,3)	S6702850
IF(IP.GT.4) GO TO 110	S6702860
CALL SYMB(25.5,22.5,0.20,PLGND(1,1),0.0,1)	S6702870
CALL SYMB(25.5,22.0,0.20,PLGND(1,2),0.0,1)	S6702880
CALL SYMB(25.5,21.5,0.2,PLGND(1,3),0.0,1)	S6702890
TMIN=TIMAV/60.0	S6702900
LALPH1=4	S6702910
CALL CODE	S6702920
WRITE(IALPHA,9003) TMIN	S6702930
CALL SYMB(27.2,21.5,0.2,LALPHA,0.0,1)	S6702940
GO TO 150	S6702950
110 IF(IDO.EQ.1) GO TO 120	S6702960
CALL SYMB(25.5,22.5,0.20,PLGND(1,4),0.0,1)	S6702970
GO TO 130	S6702980
120 CALL SYMB(25.5,22.5,0.20,PLGND(1,5),0.0,1)	S6702990
130 IF(LAYTOP(2).LE.0) GO TO 150	S6703000
IF(IP.EQ.6) GO TO 140	S6703010
CALL SYMB(25.5,22.0,0.20,PLGND(1,6),0.0,1)	S6703020
140 CALL SYMB(25.5,21.5,0.20,PLGND(1,7),0.0,1)	S6703030
C	S6703040
C RETURN TO RMCLM	S6703050
C	S6703060
C	S6703070
150 RETURN	S6703080
C	S6703090
C END OF LABEL	S6703100
C	
END	

	CALL PLOT(2.5,22.5,3)	S6702070
70	CALL SYMB(1.0,7.7,0.2,YLAB(1,YUNITS),90.0,1)	S6702080
	IZ=1	S6702090
C		S6702100
C	PRINT OUT CLOUD HEIGHT, TIME OF RISE, TOP OF LAYER	S6702110
C	BOTTOM OF LAYER, AND HEIGHT OF CALCULATION ON THE PLOT	S6702120
C		S6702130
80	IF(CALHT.GT.ALT(LAYTOP(1)+1)) IZ=2	S6702140
	IF(MODEL4 .AND. IDO.EQ.4 .AND. LAYTOP(IZ+1).GT.0) IZ = IZ + 1	S6702150
	LALPHA=5	S6702160
	CALL CODE	S6702170
	WRITE(IALPHA,9002) H	S6702180
	CALL SYMB(12.3,22.5,0.20,LALPHA,0.0,1)	S6702190
	CALL CODE	S6702200
	WRITE(IALPHA,9002) TAU	S6702210
	CALL SYMB(12.3,22.0,0.20,LALPHA,0.0,1)	S6702220
	CALL CODE	S6702230
	WRITE(IALPHA,9002) ALT(LAYTOP(IZ)+1)	S6702240
	CALL SYMB(12.3,21.5,0.20,LALPHA,0.0,1)	S6702250
	CALL CODE	S6702260
	WRITE(IALPHA,9002) ALT(LAYBOT(IZ))	S6702270
	IF(IALPHA(2).LT.20060B) IALPHA(2)=20060B	S6702280
	CALL SYMB(12.3,21.0,0.20,LALPHA,0.0,1)	S6702290
	CALL CODE	S6702300
	WRITE(IALPHA,9002) CALHT	S6702310
	IF(IALPHA(2).LT.20060B) IALPHA(2)=20060B	S6702320
	CALL SYMB(12.3,20.5,0.20,LALPHA,0.0,1)	S6702330
C		S6702340
C	PRINT OUT THE SOUNDING TIME ON THE PLOT	S6702350
C		S6702360
	LALPHA=20	S6702370
	CALL CODE	S6702380
	WRITE(IALPHA,9004) ISTIME,LSDT,ISDAY,ISMON,ISYEAR	S6702390
	IF(IALPHA(1).LT.30000B) IALPHA(1)=IALPHA(1)+10000B	S6702400
	CALL SYMB(20.5,22.5,0.20,LALPHA,0.0,1)	S6702410
C		S6702420
C	PRINT OUT THE PREDICTION TIME ON THE PLOT	S6702430
C		S6702440
	CALL CODE	S6702450
	WRITE(IALPHA,9004) JTIME,LSDT,JDAY,JMON,JYEAR	S6702460
	IF(IALPHA(1).LT.30000B) IALPHA(1)=IALPHA(1)+10000B	S6702470
	CALL SYMB(20.5,22.0,0.20,LALPHA,0.0,1)	S6702480
C		S6702490
C	PRINT OUT THE LAUNCH TIME ON THE PLOT	S6702500
C		S6702510
	CALL CODE	S6702520
	WRITE(IALPHA,9004) LTIME,LSDT,LDAY,LMON,LYEAR	S6702530
	IF(IALPHA(1).LT.30000B) IALPHA(1)=IALPHA(1)+10000B	S6702540
	CALL SYMB(20.5,21.5,0.20,LALPHA,0.0,1)	S6702550
C		S6702560
C	PRINT OUT THE RUN LOCATION ON THE PLOT	S6702570
C		S6702580

C		S6701550
C	GET PLOT TITLE	S6701560
C		S6701570
	LALPH1=PTITL(1,IPM3)	S6701580
	I12=LALPH1/2+1	S6701590
	LALPH1=LALPH1+LPLLNT(6,IDO)	S6701600
	I2=LALPH1/2+1	S6701610
	DO 20 I=2,I2	S6701620
	IF(I.GT.I12) GO TO 10	S6701630
	LALPHA(I)=PTITL(I,IPM3)	S6701640
	GO TO 20	S6701650
10	LALPHA(I)=LPLLNT(I-I12,IDO)	S6701660
20	CONTINUE	S6701670
	CALL SYMB(9.7,23.4,0.5,LALPHA,0.0,1)	S6701680
	FI=0.0	S6701690
	IF(IP.NE.5.OR.IDO.NE.1) GO TO 30	S6701700
C		S6701710
C	SET UP pH SCALE	S6701720
C		S6701730
	FI=0.0	S6701740
	FY=16.4	S6701750
	IY=15	S6701760
	DI=0.5	S6701770
	GO TO 40	S6701780
C		S6701790
C	SET UP LINEAR SCALE	S6701800
C		S6701810
30	FI=10.0	S6701820
	FY=22.4	S6701830
	IY=21	S6701840
	DI=-0.5	S6701850
C		S6701860
C	PLOT Y-UNITS	S6701870
40	DO 50 I=1,IY	S6701880
	LALPH1=4	S6701890
	CALL CODE	S6701900
	WRITE(IALPHA,9006) FI	S6701910
	CALL SYMB(1.2,FY,0.2,LALPHA,0.0,1)	S6701920
	FI=FI+DI	S6701930
	FY=FY-1.0	S6701940
50	CONTINUE	S6701950
C		S6701960
C	PLOT Y-AXIS	S6701970
C		S6701980
	FY=3.5	S6701990
	CALL PLOT(2.5,2.5,3)	S6702000
	DO 60 I=1,IY-1	S6702010
	CALL PLOT(2.5,FY,2)	S6702020
	CALL PLOT(2.2,FY,2)	S6702030
	CALL PLOT(2.5,FY,2)	S6702040
	FY=FY+1.0	S6702050
60	CONTINUE	S6702060



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